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PANEL DISCUSSION ON PEPTIC ULCER

DR. JULIAN RUFFIN (Durham), Chairman: We have chosen a topic for discussion which is of interest to the medical man, surgeon, and general practitioner alike. All of them are confronted from time to time with the problems of ulcer.

The importance of peptic ulcer is due to the fact that it is so tremendously prevalent. It has been demonstrated that ulcer occurs in 10 per cent of the population of this country. With few exceptions, it is responsible for more loss of time from work than any other disease. Its complications are serious and not infrequently fatal. It becomes a matter of practical importance, therefore, that doctors be fully aware of the importance of this disease and be prepared to treat it properly.

We have divided the subject into four parts, which will be presented as follows:

Medical Aspects—Dr. Walter R. Johnson
Radiologic Aspects—Dr. Allan Tuggle
Surgical Aspects—
Dr. Howard H. Bradshaw
Psychiatric Aspects—Dr. M. H. Greenhill

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CLINICAL DIAGNOSIS

WALTER R. JOHNSON, M.D.

ASHEVILLE

Our chairman has suggested that this discussion be made as practical as possible for the man who does not have access to modern laboratory and x-ray facilities. For this reason I am going to confine my remarks to a consideration of the accomplishments possible by use of our five senses plus a Levin tube and a buret.

The function of the medical man, flanked on one side by the x-ray specialist who "makes the diagnosis" and on the other by the surgeon who "cures" ulcer, might seem, at first blush, not very important. On the contrary, however, the role of the internist or general practitioner is of the utmost importance, because it is he who sees and cares for 85 to 90 per cent of these patients. It is he who tries to make the diagnosis, institutes treatment, and endeavors to keep his patients out of the hands of the surgeon. I think you will agree that, no matter how poorly his role is fulfilled, it is, indeed, a most important one.

Is it possible to make a diagnosis of peptic ulcer without the aid of x-ray study? I think it is, at least when the ulcer is of the simple, uncomplicated variety. I do not advocate it as a routine procedure; but when economic or other important considerations make x-ray examinations unavailable, I believe it is entirely justifiable to make a clinical diagnosis on the basis of the history and the results of an Ewald test meal, plus the response or absence of response to treatment.

Diagnosis of Uncomplicated Ulcer

The story of uncomplicated peptic ulcer is one of the most typical, stereotyped, and pathognomonic symptom complexes in medicine. I do not think any of us would hesitate to make a diagnosis of angina pectoris from the history alone. Why should we hesitate to do the same for the ulcer-bearing patient who consults us? Periodicity of epigastric discomfort is one of the important features of uncomplicated peptic ulcer. Daily discomfort for one to several weeks, followed by weeks or months of complete freedom from distress, is almost invariably experienced by these patients. During the period of discomfort the patient usually awakens from a sound night's sleep feeling entirely well. He has no discomfort, and he eats his breakfast with pleasure. This sense of well-being per-

sists for several hours (two to four or five) and then gives way to a vague epigastric distress, variously described as a "full, bloated feeling," an "empty, gnawing, hungry feeling," a "dull ache," a "sore, raw feeling," or a "burning discomfort." Many patients call it pain, but when asked to describe the sensation decide it is not pain but something akin to the above descriptive phrases.

Usually by the time the patient consults a doctor, he has learned that a glass of milk, a drink of water, a dose of soda, a tablet of Amphojel or Tums supplied by a kind friend, or some other material placed in the stomach will relieve his distress completely. He eats lunch with relish and continues to feel perfectly well until late in the afternoon, when the same unpleasant epigastric discomfort again makes its appearance. Again it is relieved by a bit of food or drink, or by the evening meal if the patient waits that long. If he goes to bed at an early hour, he will not be troubled again until 10 or 11 o'clock the following morning; but if he goes to a movie or sits up late or has a fuss with his wife or family, he may experience the distress before bedtime. Only rarely is he awakened from a sound sleep by epigastric distress; but if he is a light sleeper, he may experience discomfort one or more times during the night.

This cyclic pattern, recurring day after day for several weeks and then disappearing spontaneously, is almost pathognomonic of ulcer. It is true that almost identical symptoms are sometimes produced by a reflex from other intra-abdominal disease or are seen in association with achlorhydria, but in a vast majority of instances, when this symptom complex is described by an otherwise healthy young man, you can be fairly certain that he is harboring a simple ulcer. Beware of the person who says that he sleeps through the night and awakens at breakfast-time with an epigastric burning sensation. He usually does not have ulcer, or if he has, it has passed beyond the simple, uncomplicated stage.

To make the diagnosis a bit more certain, it is easy to obtain gastric contents thirty to sixty minutes after a meal of toast and water, and titrate the filtrate for free hydrochloric acid. If acid is absent, the symptoms are not due to ulcer. If a high degree of acid is present, the diagnosis of ulcer is much more certain. Finally, if the patient responds immediately to a frequent feeding program, the probability of ulcer is still further enhanced.

I have said nothing about physical examination, because it is rarely of value except from a negative standpoint. A spot of epigastric tenderness is usually found, but that is all.

Of course, it is never wise to proceed without x-ray confirmation of your diagnosis if it is at all possible to obtain it. Early gastric cancer can produce symptoms identical with those I have detailed, and in patients of middle age this possibility must always be kept in mind.

Diagnosis of Complicated Ulcer

Unfortunately, not all ulcer patients will relate the typical diagnostic story, and it is easy to be led astray when concomitant nervous indigestion, other intra-abdominal disease, or lesions of the heart muddy the waters. Complications of ulcer, such as partial obstruction or slow perforation with attachment to adjacent viscera, often modify the story so as to render it unintelligible. In such instances, a simple little device is usually of extreme value. Ask the patient to give you an hour-by-hour account of his activities and symptoms from the moment he awakens until he goes to sleep at night. With a little help from his wife or family, he will then correlate his symptoms and relate them in ordered fashion. If the story is still too complex, ask him to go back five or ten years and describe a typical day's history. Often in this fashion you will uncover an old ulcer story that has been completely covered up by a host of new symptoms.

Summary

Any general practitioner, no matter how isolated, can, by means of a carefully taken history, plus a test meal, make a reasonably accurate presumptive diagnosis of peptic ulcer and institute proper treatment long before the patient's symptoms are sufficiently severe to warrant investigation by a gastroenterologic clinic. Proper treatment at this stage may obviate the complications so often encountered when peptic ulcer is neglected.

RADIOLOGIC DIAGNOSIS

ALLAN D. TUGGLE, M.D.

CHARLOTTE

In any discussion entered into by members of the various divisions of medicine, it is necessary to agree on nomenclature and anatomy. For that reason, I shall first describe the anatomy of the stomach as it is generally held by radiologists.

Anatomy of the Stomach

The cardia lies above the esophageal orifice.

The body or *pars media* is that portion between the cardia and the angle of the stomach, at which point the *pyloric antrum* begins and extends to the *pylorus* proper. It is probably better to call this portion of the stomach the *antrum*, rather than the pyloric antrum, because of the differences which arise when some people consider the antrum as the pylorus.

The stomach has its *greater* and *lesser curvatures*, and these curvatures, for descriptive purposes, are carried over into the first portion of the *duodenum*—the superior portion of the cap being its lesser curvature, and the inferior portion being its greater curvature. Much less attention is paid now than in former years to the position and type of the stomach—that is, whether the fishhook or the staghorn type. In the same individual the stomach may assume the fishhook shape in the upright position, and the staghorn shape in the supine or prone position.

Radiologic Examination of the Stomach

It was the physiologist, Cannon, who first filled the stomach with an opaque material and recorded its shadow on a sensitized plate. Since that time there has been a gradual and sometimes spectacular development in our knowledge concerning both the abnormal and the normal physiology of the digestive tract.

In the early years of radiology the organ to be studied was filled with an opaque substance, and indentations or outpocketings were then identified as additive or subtractive shadows either by fluoroscopy or on the film. Since the work of Berg, Forssell and others, the radiologic examination of the stomach now goes further and includes a study of the rugae—their size, shape, direction, and convergence or divergence. In this manner diagnoses have been made much more accurate.

Manipulation and pressure on the stomach following a small swallow of barium will show the rugae extending along the lesser curvature of the stomach. Along this lesser curvature, and in the mid-portion of the body, they are longitudinal and vary in size. The rugae on the greater curvature side are somewhat irregular, and in profile this irregularity produces a ragged appearance of the greater curvature. As the antrum is reached, the rugae become somewhat thinner; they may be in parallel formation, longitudinal to the antrum, or they may be obliquely placed. The rugae vary in appearance, depending on the distention of the stomach.

The cap or first portion of the duodenum, in which by far the greater number of ulcerations are found, is described as being roughly like a chocolate drop. It varies in size, shape, and position in different individuals, as does the stomach.

The mucosa of the cap is similar to that of the stomach in that the rugae are roughly longitudinal and parallel, whereas at the beginning of the second portion of the duodenum the mucosa assumes a lacework or lattice appearance.

Roentgenologic Manifestations of Ulcer

Gastric ulcer

Ulcers manifest themselves by retention of barium in the crater. When the ulcer is viewed laterally, the barium seems to extend beyond the normal confines of the stomach. If the ulcer is seen *en face*, it shows a small blotch of barium which appears denser than the surrounding barium. The rugae may be seen to converge on the crater, and inflammatory reaction may produce a slight halo around the crater. This halo should be studied carefully, however, in order to rule out ulceration within tumor as its possible cause.

In gastric ulcer a spasm often occurs on the opposite wall of the stomach. This has been described as a finger pointing toward the ulcer. Gastric ulcers are generally found on the lesser curvature, in the body, and on the posterior wall.

Duodenal ulcer

Ulcers in the duodenal cap are also manifested by retention of barium in the crater.

Palpation with the protected thumb will dislodge barium from around the ulcer, but at all times the crater should retain its barium. Rotation of the patient will show the crater extending from one of the margins of the cap. Generally, but not always, there is an associated defect of the cap itself or even multiple defects. The crater is generally found at the convergence of the defects.

With either gastric or duodenal ulcer, there may or may not be an associated pylorospasm.

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SURGICAL TREATMENT*

HOWARD H. BRADSHAW, M.D.

WINSTON-SALEM

The surgeon really has a very small part to play in the ulcer problem. Perhaps 10 per cent of the patients, after much debate and discussion, will finally be treated by the surgeon. No intelligent surgeon feels that surgery is the answer. It is not very gratifying to remove a large amount of normal stomach in order to treat a 3- or 4-cm. lesion which is not even in the stomach, but is outside it.

Recently there has been a revival of previously held theories concerning the cause or causes of ulcer and some proposed lines of attack. As in previous years, however, there is little concrete experimental or clinical evidence to lend support to much of the theorizing. Such ill defined and poorly understood matters as tissue resistance and psychic trauma are being much discussed in certain quarters. We are all aware in a vague way that such factors are probably important in many other disease processes, as well as in ulceration of the stomach or duodenum. In the present state of our ignorance, however, there seems to be little that can be done along such lines. Out of the various theories may come some really valuable research that will help to clarify this problem.

The aim of treatment should be to have a patient who has either healed his ulcer or has learned to live with it. This aim is not realized in a fair percentage of patients. It is then that surgery must be considered, and only then. When, despite good medical care, an ulcer prevents a man from earning a livelihood because of discomfort or is a threat to his life because of complications, then the treatment should be changed. It seems foolish for internists and surgeons to argue heatedly about the virtues of their procedures. All too often they both fail. Certainly the numerous and frequent changes in both medical and surgical therapy attest to that fact.

In the whole problem of ulcer, acid has been a common denominator to which other fractions may be added or from which they may be subtracted. Even that common denominator is being questioned by some. It is, however, generally true that if patients can be kept in a state of achlorhydria or hypochlorhydria they will have little ulcer distress and will rarely develop subsequent ulcers if the original one has healed or been removed.

Gastro-Enterostomy

The idea of performing a gastro-enterostomy in order to allow the duodenal juice to dilute the gastric content and the acid to drain has not proved sound. A large percentage of patients have recurrence of symptoms, with acid values as high as before.

Vagotomy

I am sure you are all interested in the results of vagotomy. Dr. Ruffin can tell you more about that than I. We have operated on 12 patients. We started out doing vagotomy through the thorax, possibly because we were more interested in the thorax, and thought we got a better approach to more of the fibers. I think that idea is wrong; I believe that the approach from below is equally good, and it allows one to confirm the diagnosis, study the lesion, and perform some drainage operation. It has been found that it is difficult for these patients to empty their stomachs, and a supplementary procedure is often necessary at the time vagotomy is done. Probably the supra-diaphragmatic approach should be abandoned entirely.

The rate of regeneration of vagus fibers in the human being is not known. Following vagotomy the stomach regains a good deal of its power to contract and empty. This may or may not mean regeneration. Therefore, it seems that, particularly in younger people, the operation of vagotomy and subsequent gastro-enterostomy is subject to grave question. No one knows what the effects of partial denervation on the liver, pancreas, and intestines are.

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Partial Gastric Resection

It is my belief that partial gastric resection is the procedure of choice in the younger ulcer patient who has failed to respond to adequate nonsurgical therapy. I do not use the term "subtotal"; it is rarely subtotal. It accomplishes at least a partial vagotomy, removes the ulcer in most instances, and provides a large opening for gastric drainage and neutralization. The results reported from large clinics, plus our own experience with about 100 patients, will, I think, bear out the statement that it has been the most satisfactory procedure employed to date. In good clinics, the mortality following this operation is about 3 per cent in uncomplicated cases. Another 10 to 15 per cent of the patients will still have symptoms; an occasional one will develop rather marked anemia. Apparently, about 85 per cent of the patients having this operation can work and be self-supporting.

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PEPTIC ULCER AS A PSYCHOSOMATIC PROBLEM*

MAURICE H. GREENHILL, M.D.

DURHAM

When an organ such as the stomach or duodenum is so seriously diseased that the lesion leads to total incapacity, hemorrhage, perforation, or neoplastic growth, it is only natural that particular attention be paid to that diseased organ. Most of the articles in the literature dealing with peptic ulcer, as well as the major portion of the addresses which have preceded this one today, have been concerned with the pathology, disturbed physiology, and medical and surgical treatment of the stomach and duodenum. The psychiatric or psychosomatic approach to the problem of peptic ulcer is a portion of another point of view—namely, "to consider the stomach not as an isolated organ, but as a functioning unit in a whole integrated organism."

Effects of Neurologic and Emotional Disturbances on the Gastrointestinal Mucosa

When one considers that ulceration of the mucosa of the stomach or duodenum may occur in association with lesions of the frontal lobes of the brain, with disturbance of the third ventricle, with destruction of nuclei of the posterior portions of the hypothalamus or of the tuber cinereum, in association with burns, and in connection with the terminal states of systemic disease, this conception of an organismic approach to the problem of peptic ulcer appears to be an obvious one. Less dramatic, but nevertheless striking, is the function of disturbed emotional states in peptic ulcer. In this conception one looks upon peptic ulcer as a manifestation of disturbed physiologic equilibrium resulting from emotional stress.

We all know that disturbing emotional states have an effect upon the stomach and duodenum. Beaumont, Richet, Carlson, and Cannon pointed out this fact long ago[1]. Alvarez[2] has intimated that emotional disturbances are not an unimportant factor in the etiology of peptic ulcer. The work of Wolf and Wolff and of Mittelmann and Wolff has recently made clearer the correlation between physiologic dysfunction, in terms of hyperemia, hyperacidity and hypermotility, and disturbed emotional states in patients with gastric and duodenal ulcer[3]. They have shown more specifically that sustained anger, anxiety, and guilt are associated with hyperemia, hyperacidity and hypermotility of the gastric mucosa, leading to increased pain and hemorrhage. Furthermore, the pharmacologic action of vasodilator and vasoconstrictor drugs, atropine, epinephrine, acetyl-B-methylcholine, and neostigmine—all of which normally have an effect upon the gastrointestinal mucosa—is reduced in the presence of heightened emotional states. Giving further emphasis to the point of view that peptic ulcer is the reaction of one end organ to what might be considered a systemic disease or a dysfunction involving the whole organism is the fact that more than the gastrointestinal mucosa is involved when patients with peptic ulcer respond to emotional disturbances with hyper-

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1. (a) Beaumont, W.: Experiments and Observations on the Gastric Juice and the Physiology of Digestion. Plattsburg, F. P. Allen, 1833. (b) Richet, C.: Des Propietes chimiques et physiologiques du Suc gastrique chez l'Homme et les Animaux, Appendice A., J. de l'Anat. et de la Physiol. 14:170, 1878. (c) Carlson, A. J.: Contributions to the Physiology of the Stomach, Am. J. Physiol. 31:151, 1912. (d) Cannon, W. B.: The Influence of Emotional States on the Functions of the Alimentary Canal, Am. J. M. Sc. 137: 480-487 (April) 1909.
2. Alvarez, W. C.: Nervousness, Indigestion and Pain, New York, Paul B. Hoeber, 1943.
3. (a) Wolff, H. G. and Wolf, S. G.: Human Gastric Function, London and New York, Oxford University Press, 1943. (b) Mittelmann, B. and Wolff, H. G.: Emotions and Gastroduodenal Functions; Experimental Studies on Patients with Gastritis, Duodenitis, and Peptic Ulcer, Psychosom. Med. 4:5-61 (Jan.) 1942.

emia, hyperacidity and hypermotility. For example, not only is there evidence of such disturbed physiology in the stomach and duodenum, but changes in finger temperature, in capillaries of the fingernail beds and in respiration are evident. That is, when a patient complains of epigastric pain and tarry stools he is observing only the most distressing of a whole series of manifestations of disturbed homeostasis.

Characteristics of the Patient with Peptic Ulcer

Not all the causes of the disturbed homeostasis which leads to peptic ulcer are known. Those who have considered the problem of peptic ulcer from the viewpoint of comprehensive medicine—which considers pathology as the reaction to injury, including the response of tissues to all types of stress, both physical and emotional—have been impressed by the type of human being who develops peptic ulcer and by the circumstances under which he develops it. To peptic ulcer may be applied the adage, "It is not only a question of what kind of disease the patient has, but of what kind of patient the disease has."[4]

If one practices medicine from the comprehensive point of view, which takes into consideration not only the physiologic and pathologic stresses to which the human being is subject, but also the social and environmental strains, one cannot help but be impressed by the emotional characteristics of the patient with peptic ulcer. These characteristics have been outlined by investigators in internal medicine and in psychiatry during recent years. The results of their investigations might be summed up as follows:

1. The peptic ulcer patient shows manifestations of increased neuromuscular tension; this observation coincides with the conception of Alvarez and others that the individual with peptic ulcer is lean, drawn, and angular. Such individuals show signs of being taut and strained, and, if asked, admit to many symptoms of tension state.

2. The exacerbations of peptic ulcer which these patients have are clearly correlated with instances of emotional crisis. Events producing emotional strain, manifested by tension and depression, are common in the lives of such individuals, and lead to attacks of peptic ulcer.

4. Taylor, F. R.: Personal communication.

3. If one takes the time to obtain a detailed life history of such patients, one finds a high incidence of psychoneurotic manifestations.

4. Individuals with peptic ulcer seem to be predisposed toward certain types of emotional strains, because of the characteristics of their personalities. Franz Alexander, Saul, and others have pointed out that these individuals are subject to emotional strain because they are constantly struggling within themselves to overcome being dependent upon another individual[5]. They are basically passive and dependent persons who fight valiantly to be completely independent, at the same time that they are tempted to lean upon someone else. At the moment that this campaign fails and they can neither be aggressively independent nor completely dependent upon another, they have so lost their feelings of emotional security that the physiologic equilibrium of the body becomes disturbed and physiologic changes result, which lead to peptic ulcer. Rosenbaum, Kapp and Romano have shown that an exacerbation of peptic ulcer, often with hemorrhage or perforation, resulted when a striving, tense, seemingly aggressive person was removed from another person upon whom he was dependent[6].

5. Another characteristic of the individual with peptic ulcer is that in his chaotic struggle for independence he is strikingly aggressive, but has difficulty in expressing his aggressive feelings. These people tend to inhibit hostility. This inhibition of hostility appears to be associated with heightened physiologic responses such as hyperemia, hyperacidity, and hypermotility of the gastric and duodenal mucosa. Such a reaction follows closely the theories of positive inductance of Sherrington and Pavlov, who hold that the inhibition of a reaction is followed by a greater reaction than would otherwise have been obtained.

6. Since every human being is subject to emotional stress, why is it that some individuals develop peptic ulcer in association with such stress? For an individual to develop a peptic ulcer he must have three characteristics which might be called a psycho-

5. (a) Alexander, F.: The Influence of Psychologic Factors upon Gastro-Intestinal Disturbances, Psychoanalyt. Quart. 3:501-539 (Oct.) 1934. (b) Saul, L. J.: Psychiatric Treatment of Peptic Ulcer Patients, Psychosom. Med. 8:204-210 (May-June) 1946.

6. Kapp, F. T., Rosenbaum, M. and Romano, J.: Psychological Factors in Men with Peptic Ulcer, Am. J. Psychiat. 103: 700-704 (March) 1947.

somatic triad. (1) He must have a constitutional predisposition to disturbance of the gastrointestinal system. One is struck by the high incidence of diseases of the gastrointestinal system in the family history of patients with peptic ulcer. (2) He must have a stomach or duodenum which is the principal reactor to a disturbance in the physiologic equilibrium of the body. (3) He must be particularly sensitive to a certain type of emotional strain—namely, an internal struggle between dependence and independence.

If these three factors are not present, an ulcer does not develop. The family history should uncover any constitutional predisposition. The finding of hyperacidity in the gastric analysis may give evidence of the predisposed organ, but obviously not in every instance. Mirsky indicates in a personal communication that a high uropepsin level in the urine is a good indication of a stomach disposed to ulcer formation[7]. The presence of personality traits which lead to peptic ulcer can be determined by a comprehensive medical history.

Applications to Therapy

This holistic point of view concerning peptic ulcer is backed by reports in the literature and by current work in internal medicine and psychiatry. This work would be mainly of theoretical value if it were not producing results in terms of therapy. Therapy based on the holistic viewpoint has been designed to re-establish the equilibrium of the person who has peptic ulcer, by producing greater emotional security within him. One can do nothing to eradicate the constitutional predisposition of such an individual. Most of the standard treatment of peptic ulcer—the Sippy diet, alkalies, belladonna, aluminum hydroxide, gastrojejunostomy, gastric resection, and vagotomy—has been designed to relieve the end organ.

It would seem to be good practice to treat the patient completely and wholly by utilizing, in addition to the methods just mentioned, some means of reducing the emotional tension which these patients often have. There are several methods which may help to achieve this aim: (1) Relief of the neuromuscular tension by teaching progressive muscular relaxation or by inducing relaxation with such drugs as the barbiturates. (2) Employment of the hospital setting or the doctor-patient relationship to give the patient a temporary feeling of dependence. (3) Removal of the patient from the emotional stress by bringing him into the hospital, or by planned efforts to get him away from the conflict. (4) Teaching the patient to avoid or control the emotional crisis which has again and again caused exacerbations of peptic ulcer, or verbally to ventilate hostility which he has bottled up.

One can only consider the stomach as a "functioning unit in a whole integrated organism." From this point of view, to quote Wolf and Wolff, "the objectives in the management of patients who exhibit the gastritis and ulcer syndrome are clear. Therapeutic efforts should be directed toward preventing or controlling gastric hyperfunction, and the problem resolves itself into one of the care of the man, rather than merely his stomach."[3a]

Discussion

Chairman Ruffin: The first question we have is, "What are the indications for surgical therapy of hemorrhage in peptic ulcer?" Dr. Bradshaw.

Dr. Bradshaw: I wish I knew the answer to that. Hemorrhage is usually not very much of a threat to younger patients. The older patient who has repeated massive hemorrhages should have an operation. One cannot answer such a question categorically.

Chairman Ruffin: The next question is: "How can one differentiate between hemorrhage from peptic ulcer and hemorrhage from Meckel's diverticulum?" Dr. Johnson.

Dr. Johnson: Only rarely can this differentiation be made clinically. The appearance of the blood from Meckel's diverticulum may suggest that the bleeding point is located fairly low in the gastrointestinal tract, but for the most part we must depend entirely upon the previous history. An antecedent history of ulcer makes the probability of bleeding ulcer more logical, whereas the absence of previous epigastric distress causes one to suspect one of the less common causes of gastrointestinal bleeding. Attacks of pain or colic in the middle or lower part of the abdomen may accompany ulceration of Meckel's diverticulum, the atypical character of which might suggest this rare complication as the cause of melena.

Chairman Ruffin: Question 3 is: "If the wife is the cause of pain from a gastric ulcer, would you advise divorce?" Dr. Greenhill, I think that is down your alley.

Dr. Greenhill: I wish we could advise divorce sometimes, but it is supposed to be against the rules, because almost every time it happens the problem bounces back on us. It certainly is not a bad idea to bring the wife into the situation when one is treating a patient with peptic ulcer who obviously has psychoneurotic difficulties. I wish I had some figures on the incidence of diseases in the wives of men with peptic ulcer. I imagine it is high.

7. Mirsky, I. A.: Personal communication.

Chairman Ruffin: Dr. Tuggle, this is for you. "What is the effect of x-ray treatment in ulcer?"

Dr. Tuggle. Roentgen-ray treatment of peptic ulcer is based on the fact that such therapy will diminish the secretion of glands. I think it was Palmer, in Chicago, who popularized radiation therapy. I have had very little experience with it. I do not think it is going to be popular, because it takes a dosage of about 3,000 r, and you can not give this much radiation to a patient for a lesion which is likely to recur.

Chairman Ruffin: Dr. Palmer and Dr. Kirsner have reported a series of cases in which it was shown that the gastric acidity comes down following roentgen therapy; it is going to recur, however, and you do not dare to give x-ray treatment again. Therefore I would say that the x-ray has no real role in the treatment of peptic ulcer.

The next question reads as follows: "Discuss the value, if any, of amino acids, as a supplement to the therapy of ulcer." Dr. Johnson.

Dr. Johnson: I believe there is general agreement that the protein hydrolysate therapy of ulcer has no specific merit, except in those patients suffering from malnutrition and hypoproteinemia. The buffering action of milk and non-soluble antacids is usually adequate, and there is little reason to force an unpalatable mixture of protein hydrolysate on the ulcer patient unless he shows definite evidence of protein starvation.

Chairman Ruffin: Next, "What percentage of patients, following subtotal gastrectomy, have a macrocytic anemia?" Do you know the percentage, Dr. Bradshaw?

Dr. Bradshaw: I do not know the exact percentage, but I think it is very small—not over 2 or 3 per cent.

Chairman Ruffin: Dr. Johnson, will you answer this: "Can you cure by medicinal treatment and diet a duodenal ulcer and allow the patient to take one good highball before dinner?"

Dr. Johnson: The answer, I think, must be yes and no. It all depends on the make-up of the ulcer-bearing patient and on the type and severity of his ulcer. Many ulcer patients get to the point where they can take a highball or two before dinner without apparent harm. If you have sold the patient on the necessity for constant and careful attention to his stomach in the form of frequent bland feedings with between-feeding antacids, together with regular hours, avoidance of tobacco and so forth, he will eventually heal his ulcer if it is uncomplicated. After his ulcer is healed, an occasional highball will do him no harm if the remainder of the ulcer program is adhered to.

Chairman Ruffin: Here are two questions for Dr. Bradshaw: (1) "Discuss vagotomy in relation to the treatment of gastric ulcer, with special reference to motility complications following vagotomy." (2) "What are the clearest indications for vagotomy?"

Dr. Bradshaw: I think the clearest indication for vagotomy is recurrence of ulcer symptoms—especially pain—after surgery. The motility, of course, is interfered with; the stomach does not empty, under normal circumstances, very well. Nevertheless, vagotomy is justifiable in such cases, and the ulcer pain is immediately relieved.

Chairman Ruffin: Vagotomy is still in the experimental stage. When a patient is not relieved by partial gastric resection, additional surgery is sometimes necessary. However, I should advise against vagotomy unless you are prepared to follow your patient closely by x-ray to determine what degree of retention exists, or unless you are dealing with a patient in whom the pre-existing stoma is still present.

I hope in less than a year to give you more definite information on this. A nation-wide survey is being made as to the results of vagotomy. Some 5000 cases have been treated by this method.

I have been asked to discuss the cause of pain in peptic ulcer. Since the pain is relieved immediately by cutting the vagus nerve, one might think that the vagus is the central pathway for the transmission of pain. However, the vagus nerve can be stimulated below the diaphragm by every means you can think of, without producing any sensation whatever. Furthermore, we have shown that spinal anesthesia causes the pain of ulcer to disappear. Since the vagus comes off the brain stem, this result could not have been produced by paralysis of the vagus. Some say the pain is due to acid bathing the base of the ulcer. Some say it is due to spasm. I do not believe we have the final answer yet.

The next question is for Dr. Greenhill: "What are the results of psychotherapy in the treatment of ulcer?"

Dr. Greenhill: There are no statistics available as to the results of psychotherapy in peptic ulcer, and I can only draw from my own personal experience. In a patient who has had peptic ulcer for several years, with repeated exacerbations, or who has had perforation or hemorrhage, the results are not very good. In the large group of patients who come in complaining of symptoms such as Dr. Johnson has described, I think some improvement in terms of less frequent and less intense exacerbations can be accomplished. That is about as much as we can say.

Chairman Ruffin: Here is a surgical question: "What percentage of patients with achlorhydria later develop carcinoma?"

Dr. Bradshaw: I do not think those figures are available, but a recent survey of patients with cancer of the stomach showed that there were more in the group with a history of low gastric acidity than with a history of relatively high acidity.

Chairman Ruffin: "Should all patients with gastric ulcer be subjected to resection?"

Dr. Bradshaw: Generally, yes. However, if the patient is elderly and is in rather poor physical condition, with an ulcer near the esophagus, that patient might well be treated conservatively and observed periodically. Of course, while observations are being made we may lose our best chance of curing a cancer. On the other hand, the operation carries considerable mortality. Nearly all patients with gastric defects who have been thought to have ulcer should have surgery, because it has been shown in many large clinics that about 22 to 25 per cent of those patients really have cancer. It is impossible to be certain before operation whether a patient has ulcer or cancer. If one decides to try a period of conservative treatment, it should not be measured in terms of months, but in terms of weeks.

Dr. Tuggle: A recent article in the **Journal of the American Medical Association** gave the percentage of error in the radiologic diagnosis of ulcerations of the stomach as 20 per cent. That is high, but most of the errors occur in the borderline lesions; other lesions can be diagnosed with a fair degree of accuracy as carcinoma or ulcer. Lesions of the antrum are particularly difficult to diagnose. Even at operation such a lesion may appear benign, and only after the pathologist gives his report can one be certain that it is malignant.

Chairman Ruffin: "Can peptic ulcer be treated

adequately by the general practitioner? If so, what do you consider the most effective method of treatment?" Dr. Johnson, will you answer that?

Dr. Johnson: As has been said before, we general practitioners are called upon to treat 85 to 90 per cent of all patients with ulcer. If we do our job effectively, our patients will be spared a tremendous amount of suffering, and a lesser number of them will eventually require surgery. The doctor himself must be convinced that adequate treatment means several years of constant care instead of the temporary and incomplete programs so often prescribed.

First of all, since it is rarely possible to persuade the patient with uncomplicated ulcer that he needs hospital care, we are forced to treat him on the hoof, whether we like it or not. I believe that a satisfactory result can be obtained from ambulatory treatment in the vast majority of instances, and I am going to confine my remarks to that form of therapy.

Of what does an adequate program consist? Three small meals of simple, bland foods, with hourly between-meal feedings of milk or the equivalent, are the mainstay of our program. The feedings should begin as soon as the patient arises in the morning and should continue until he goes to sleep at night. If nocturnal distress occurs, additional feedings should be taken. In addition, the use of belladonna plus phenobarbital (Belbarb, Donnatal or Barbidonna tablets) three or four times daily is usually helpful. If pain is severe and gastric acidity high, a non-soluble antacid, such as Creamalin, Amphojel, or Gelusil, is indicated. I prefer to use the tablet form because it is so much simpler to carry tablets than to carry a huge, messy bottle of liquid preparation. The tablets can be popped into the mouth, chewed, and swallowed midway between all feedings, whether the patient is hoeing corn, driving a truck, pounding a typewriter, shopping, or what not.

Adequate treatment also means abstinence from tobacco and alcohol, and this is where we so frequently encounter our greatest difficulty. I have seen patients who faithfully followed an hourly feeding schedule with antacids and nerve sedatives, but continued to smoke and to have night pain of such degree that life was not worth while. When finally persuaded that they must either give up cigarettes or three fourths of their stomachs, they stopped smoking and almost immediately obtained complete relief from ulcer pain. Such dramatic results could scarcely be mere coincidence, so I am a stickler for elimination of tobacco from the ulcer regimen. The same statement applies to coffee and other caffeine-containing drinks. Tobacco, alcohol, and caffeine have all been shown to be potent stimulants of gastric acid secretion, and such stimulation is exactly what our ulcer program is designed to prevent.

Almost all patients will achieve complete freedom from peptic ulcer symptoms, even while at work, if they follow a regimen such as I have outlined for a week or two. The frequency of feedings can be lessened as healing progresses, and eventually, after four to six weeks of satisfactory progress, a daily program of six feedings can be adopted. If the six-feeding schedule is followed faithfully for a year or two, the patient is well on his way to successful and perhaps permanent control of his ulcer.

Chairman Ruffin: What about the psychosomatic effects of smoking?

Dr. Greenhill: If patients smoke so much that the doctor can not get them to stop, they smoke because they are tense. In order to get them to stop smoking one might have to substitute some other outlet for the tension.

Chairman Ruffin: That concludes the panel discussion, and we thank you for your interest.

CORRECTION OF THE NASAL PROFILE LINE

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and
JAMES W. KELLEY, M.D.
DURHAM

Psychologic Effects of Facial Disfigurements

The person with an unsightly nasal abnormality may be seriously handicapped in the business and social world, and as a direct consequence may develop somatic and psychic disturbances. In many instances, these visible and conspicuous nonconformities are more harassing than congenital or acquired defects in other parts of the body. Many individuals readily compensate for physical or physiologic impairments, but there is no mechanism that will shield an individual with a facial disfigurement from the continued attack upon his self-esteem. The person who is unhappy because of an unsightly nose or protruding ears will have his inner security assailed each time he looks into a mirror.

To many physicians the nose is a rather uninteresting part of the body, unless there is some nasal obstruction or impairment of breathing. To the individual, however, an external deformity of the nose—whether congenital or the result of injury or disease—may be the primary object of concern, even though no obstruction exists. Such unfortunates, children or adults, should be given an opportunity to have this handicap removed. They should not be encouraged to endure the misery and abuse to which they are subjected, for no one knows the indelible mental effects thus produced.

The need for reconstructive plastic surgery to correct the condition, and to diminish the handicap and the possible psychologic sequelae is evident. It should not be inferred, however, that every individual with a nasal abnormality should be operated upon; for there is no direct relationship between the

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size or severity of the physical defect and the reaction to it. Individuals with only slight or seemingly minor facial abnormalities frequently suffer more mental distress than those whose defects are pronounced[1]. This mental distress, which stems not from the physical factors but from psychologic ones, is as real as actual physical pain and demands tolerant and understanding consideration.

The plastic surgeon must distinguish between the patient whose anxiety is based upon factors other than the presenting complaint, and the patient suffering from a situational reaction. If a surgeon, consulted by a patient whose psychologic state may be a reflection of the deformity, is uncertain as to the nature of the reaction or anxiety, he should have no more hesitation in requesting an interview with a psychiatrist than in asking for a medical or urologic consultation, or a roentgen examination. The psychiatrist will be able to help differentiate those patients whose reaction is related to the disfigurement, and in whom a repair or improvement of the abnormality will be helpful, from those with a psychiatric condition who will only find another symptom for the expression of emotional difficulties if the deformity is repaired. The psychologic result of the operation will be entirely different in these two types of patients. In one instance, a helpful service will have been rendered; in the other, a great wrong may have been committed.

As a general rule, the more pronounced the deformity or loss, the more likely is a reasonably good result from a plastic operation to be acceptable to the patient. Conversely, it is well to be cautious about embarking upon the correction of slight defects[2]. A patient's inability to state accurately and succintly the particular thing that displeases him should cause the surgeon to have grave doubts concerning his ability to satisfy, and should excite suspicion that the accused nose might not be the real difficulty. There is a class of patients who have a nasal complex not relieved by operation, however successful, and operations on such patients are to be avoided. The differential diagnosis between the genuine and the false is, at least in some instances, one of considerable difficulty. The help of a psychiatrist is of great value when there is any doubt.

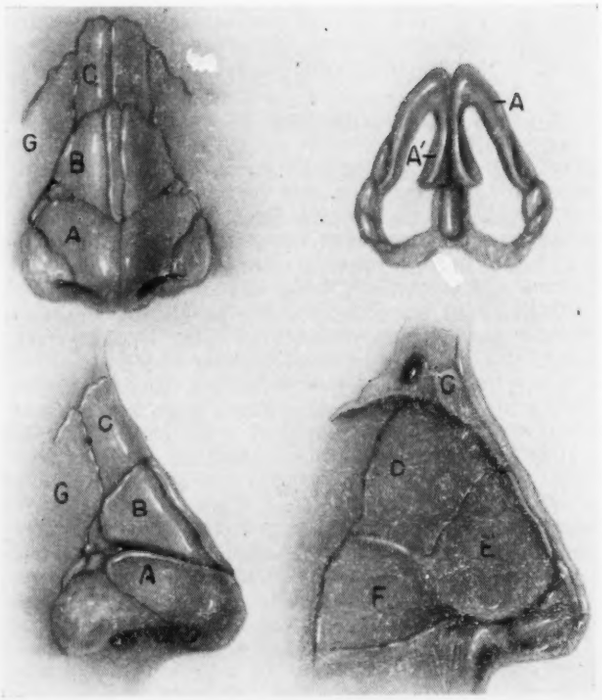

Fig. 1. Bone and cartilaginous framework of the nose. The lower part of the nasal framework is cartilaginous; the upper part consists of bone. The nasal bony arch consists not only of the nasal bones (C), but also of the nasal process of the superior maxilla (G). The lower lateral cartilage, the alar cartilage, is horseshoe-shaped, consisting of a lateral crus (A), which aids in the formation of the ala, and a medial crus (A') which, with the medial crus of the opposite side, supplies the structural support for the columella. The cartilaginous septum (E) forms the greater part of the median partition. Anteriorly the septal cartilage becomes continuous with the upper lateral cartilage (B), the triangular cartilage, which diverges from it in a winglike manner. The osseous septum comprises the perpendicular plate of the ethmoid (D), the vomer (F), and the frontal spine of the nasal bone.

Etiology of Nasal Deformities

An appreciation of the etiologic factors underlying nasal deformities is essential, since failure to recognize them may nullify the expected good result of an operation which has been performed expertly.

Heredity

Many hypotheses have been advanced to explain the cause of nontraumatic nasal disfigurements. Some investigators believe them to have a phylogenetic origin. The fact that nasal deformities are practically unknown among animals and savages[3], and

1. Gillies, H. D.: The Development and Scope of Plastic Surgery, Bull. Northwestern Univ. M. School 35:1, 1935.
2. Blair, V. P., and Brown, J. B.: Nasal Abnormalities, Fancied and Real, Surg., Gynec. & Obst. 53:797-819 (Dec.) 1931.
3. Fomon, S.: Surgery of Injury and Plastic Repair, Baltimore, Williams and Wilkins Company, 1939.

are rarely found in semicivilized races, lends support to the assumption. The protagonists of this theory believe that the forward cranial extension incident to the growth of the brain in its development from the anthropoid to the human form has encroached upon the nasal bones and resulted in a lack of balance between the facial and cranial parts of the skull.

The nasal pyramid (fig. 1), wedged between the unyielding frontal, maxillary, and ethmoid bones, is in a fixed position. If the hypothesis just discussed is true, any change in the cephalocaudal diameter will lead to buckling and deviation of one or more of the nasal elements. An unbalanced development of the adjoining facial bones may also affect the symmetry of the nasal pyramid. Maldevelopment of one component part of the nasal pyramid may influence the growth of the remaining nasal elements (fig. 2 and 3). A preponderance in strength of one bone over another may cause dislocation or bending of the weaker.

An overdeveloped vomer may crowd against the descending perpendicular plate of the ethmoid, causing distortion of the septum and dislodgment and asymmetry of the nasal structures which are dependent upon it for support. The normal high-arched palate of childhood may fail to descend, because of underdevelopment of the maxillary bones. This high arch leaves less room in the vertical diameter for the growth of the vomer below and the perpendicular plate of the ethmoid above; in the process of expansion these bones must then encroach upon the septal cartilage between, thus affecting

Fig. 2. The artistic creative power is the important factor in the success of the rhinoplastic operation, which may change the patient's entire facial appearance and expression. A long pointed nose with a small hump produces a deformity which in some individuals may produce indelible effects.

Fig. 3. A large nose situated on a relatively small face. The entire profile line was altered by corrective rhinoplasty in a single operation. While the glabellar angle was essentially normal, the elevated profile level was due to the anterior flare of the upper lateral cartilages, which, together with the high nasal septum, produced a nose out of all proportion to the size of the patient's face. In addition to altering the nasal bridge, the nostrils were shortened and the upper lip lengthened.

the structure and contour of the entire nose. Conversely, a hard palate which is too low may bring about a deformity by causing a downward dislocation of the nasal structures.

The facial features of the progeny of mixed races are unfortunately not a fusion but a conglomeration of the composing elements, wherein the genes which carry the disfigurement struggle for supremacy. For example, a large nose inherited from one parent may be crowded into a small face inherited from the other (fig. 3).

Trauma

Because of its prominence on the face, the nose is subject to violence in all periods of life. In the prenatal state, deformations are said to be caused by the pressure of amniotic bands, adhesions, excessive contraction of the uterus, or trauma applied to the abdomen of the mother. During the course of prolonged labor considerable pressure may be exerted on the nose, and despite the elastic and pliable consistency of the nasal structures, permanent nasal injury may result. When forceps are employed in the delivery of an unrotated head high in the pelvic inlet, the tip of one blade is likely to press against the base of the nose, thereby deforming it.

Growing children are especially liable to nasal trauma. Unfortunately, such an injury received in childhood, producing at the time no visible deformity and therefore regarded as of little importance, may cause serious interference with the future development of the nasal framework. In adults also, fractures and dislocations of the nasal bones and cartilages may not be manifest until some time after the injury.

Inflammation

In *syphilitic involvement* of the nose, all of the elements may be destroyed and replaced by unyielding scar tissue. The disfigurement is quite characteristic: because of the lack of supporting structures, the bridge falls, and a saddle nose results. The loss of mucous membrane and the subsequent contraction of scar tissue cause the tip and alae to retract so that the plane of the nostrils assumes an upward position. The skin is pale and glossy, and as time progresses it may be destroyed, leaving only a hole to mark the place where the nose was located originally.

Lupus usually begins in the cartilaginous septum at the junction of the skin and the mucous membrane; from here it spreads to the external surface. Here the contraction of the scar tissue results in a downward bending of the tip and a narrowing of the anterior nares. The bones are usually not involved.

Other inflammatory diseases causing nasal disfigurements by distortion and contraction are actinomycosis and rhinoscleroma. These processes begin as a hyperemia; but since the bone is not capable of swelling, the tension in the haversian system rises, and the exudate is forced between the periosteum and the bone. The pressure of the fluid eventually strangulates the blood supply, and there results an absorption of the nasal elements with consequent disfigurement.

Neoplasms

Neoplasms may cause deformity either by the exertion of intranasal pressure or by their external position (fig. 4).

Anatomic Aspects of Nasal Deformities

Bone-cartilage framework

The two nasal bones articulate with each other in tent fashion anteriorly to form the bridge of the nose, and with the nasal process of the maxilla laterally. Above, they are narrow and strong and supported by the bony septum. Below, they become thinner

Fig. 4. Total reconstruction following amputation of the nose for carcinoma. The flap was elevated from the forehead and the unused portion was replaced.

and wider, and this relative weakness, as well as their exposed position, accounts for the prevalence of fractures in this location (fig. 1).

The *septal cartilage* gives structural support and contour to the lower half of the bridge of the nose and forms the greater part of the median partition. Anteriorly it becomes continuous with the upper lateral cartilages. The septal cartilage is involved in almost every nasal disfigurement. Being a flexible body, it yields easily to pressure and may be dislocated from any or all of its attachments. If it is dislodged or bent, or if for any reason it fails to exercise its function of support, the surrounding structures then also become displaced. During the period of development the septal cartilage, through vertical upward pressure by the vomer below it, raises the dorsum of the nose. This fact explains the failure of the forward extension of the nose when disease or injury to the vomer occurs before puberty.

Spurs on the septum may have to be removed prior to rhinoplasty, since the narrowed nasal arch may impinge upon them and cause obstruction (fig. 5). Associated with a long nose is an overhanging septum, and for its correction a wedge of the septum and mucous membrane is removed (fig. 5). Should this deformity be associated with a protruding upper lip, both can readily be corrected by removing the nasal spine and readjusting the nasolabial angle after the method of Aufricht[4].

Fig. 5. Deviation of the anterior septum may cause nasal obstruction in addition to the external deformity of the nose. The hump nose with an associated overhanging columella and septum was corrected by first removing the overdeveloped nasal bones and cartilages, to lower the nasal bridge line. Removal of a wedge from the anterior border of the septum, together with the redundant mucous membrane, then elevated the tip and reduced the entire size of the nasal pyramid.

4. Aufricht, G.: A Few Hints and Surgical Details in Rhinoplasty, Laryngoscope, 53:317-335 (May) 1943.

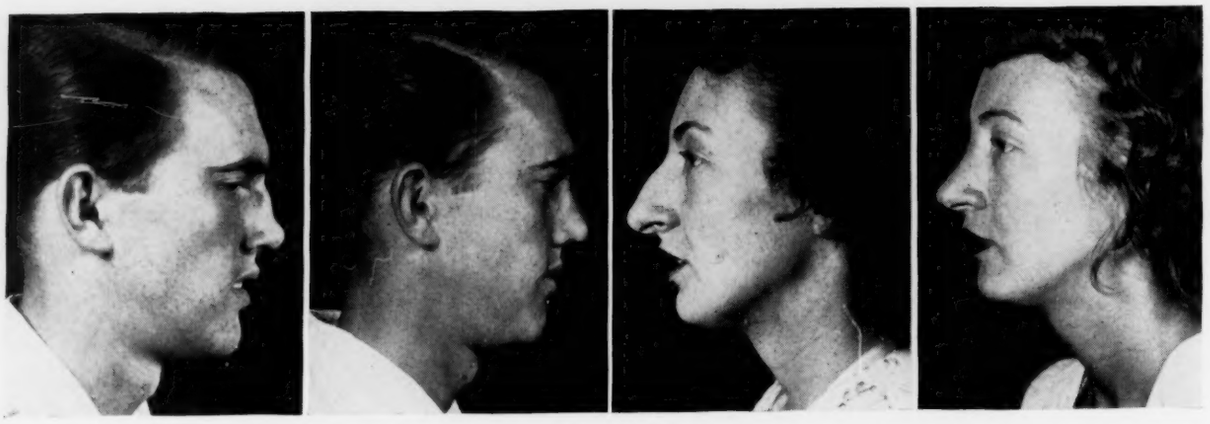

Fig. 6. Submucous operations in which the septum is extensively resected, the thickened vomer removed, or the anterior nasal spine sacrificed may cause the nasal bridge line to become concave, producing a "false hump." With the consequent lowering of the tip of the nose, the columella may retract. The deformity may be corrected by insertion of an L-shaped piece of sculptured cartilage, fresh or preserved.

Fig. 7. A long nose with a bulbous tip corrected in a single sitting.

The anterior extremity of the vomer abuts on the incisive crest of the maxillae and is of much surgical importance. It is here that the lower segment of the septal cartilage, which supports the tip of the nose, is inserted (fig. 1). Submucous operations in which the thickened vomer is widely resected, and especially when the adjacent nasal spine has been sacrificed, are likely to result in sinking of the dorsum and a consequent lowering of the tip of the nose (fig. 6).

The *upper lateral cartilages*—the triangular cartilages—are two flat plates situated immediately below the free border of the nasal bones, spreading downward and outward from the septum with which they are directly continuous. They form the approximate middle third of the nose and are extremely important elements in the maintenance of normal contour in this location. These upper lateral cartilages form the body of the nose and, with a hump, flare anteriorly (fig. 3). With a broad bridge they are usually widened and flat; with saddling or a depressed bridge, they are sunken and deviated. When associated with an old harelip, they may be flattened and depressed on the affected side.

The *lower lateral cartilages*—the alar cartilages—encircle the nostrils and assist in maintaining their patency. Each cartilage consists of a medial and a lateral crus (fig. 1). The two medial crura approximate each other in the median plane. Together with their investing soft tissues, they form the lower part of the nasal septum, which, owing to its free mobility, is referred to as the *movable septum*. Above, the medial crura are united to the septal cartilage; posteriorly, they end in free out-turned borders; anteriorly, they bend to form angles with the lateral crura. The approximation of the two angles then forms the tip of the nose. Sheehan[5] has stated that, of all the elements of the nasal framework, the one requiring the most delicate handling is the lateral extension of the alar cartilages (fig. 7). The configuration of the nostrils is directly dependent upon the size, position, and contour of these cartilages.

Columella

The character of the columella, be it long, short, narrow, or wide, will affect the shape of the nostrils. Often an oblique columella will be straight when more of the lower lateral cartilage is removed from either one side or the other. A retracted columella may be corrected in some instances by elevation of the tip of the nose (fig. 8). Other cases require the introduction of a supporting strut through a small separate incision. A hanging columella (fig. 7) may be corrected by removal of a portion of skin from both sides, or by utilization of the Aufricht procedure[5] to correct the nasolabial angle. Occasionally surgery is required on the columella itself. A Z flap may be inserted at the base or tip to correct an abnormally oblique one, or a V or Y incision may be made at the base or tip for one especially short.

Arteries and veins

The arterial supply to the nose is derived from the internal and external maxillary

5. Sheehan, J. E.: Plastic Surgery of the Nose, ed. 2, New York, Paul B. Hoeber, Inc., 1936.

Fig. 8. A hook nose, producing a retracted columella and a short upper lip. By reconstruction of the nasal pyramid, many of the facial angles were changed. The upper lip was lengthened at the same time to produce symmetry of the lips and balance with the chin.

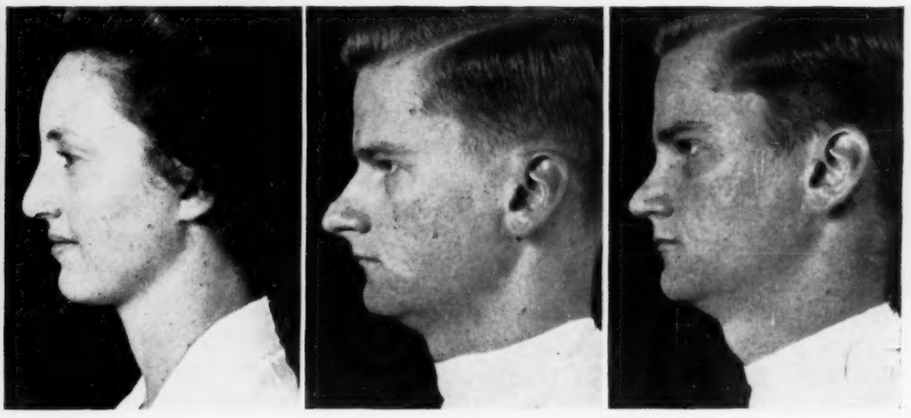

Fig. 9. Webbing of the upper lip, associated with a slight hump, causes an optical illusion simulating a receding chin. The nasolabial angle was corrected by removing a small segment from the anterior border of the septum and the anterior nasal spine, and then adjusting the lip to harmonize with the facial contour.

(branches of the external carotid) and from the ophthalmic, a branch of the internal carotid. These arteries terminate in capillary plexuses which supply the nasal mucosa, glands, and skin. The veins form a close cavernous network immediately beneath the mucous membrane. They anastomose freely and terminate in the anterior facial and ophthalmic veins.

Nerves

The *sensory nerve* supply of the external nose is derived from: (1) the infratrochlear, supplying the skin of the root, (2) the nasociliary branches of the ophthalmic, supplying the alae and tip, and (3) the infraorbital branch of the superior maxillary, supplying the sides. The only *motor nerve* to the nose is a branch of the facial which is distributed to the alar muscles.

Muscles

The muscles of the nose are vestigial. Immobilization following reduction of nasal fractures thus offers little difficulty, because there is no muscular pull that would tend to displace the fragments. The principal muscles of the external nose are the compressors and dilators of the nostrils and the depressors and elevators of the alae nasi.

Preoperative Analysis of the Deformity and the Plan of Reconstruction

Before attempting the correction of any nasal deformity, it is imperative to have a clear mental picture of the final result to be achieved. The proper form and dimensions of the nose to be reconstructed can be estimated only by a comparison of the deformed organ with some standard. The creation of a single norm applicable to all faces is impossible, since the correct proportions of a given nose will, for the most part, depend upon the character of the structures which immediately surround it. Furthermore, a norm such as this would not be desirable, since criteria of the ideal shape are by no means universally accepted. Although no fixed standard can be determined, one may establish an esthetic norm for each individual face, to serve as a basis for the calculation of the deformity. Considerable judgment will be necessary in evaluating each person and face, for in some individuals variations from fixed measurements and proportions, even though outside of our arbitrary normal limits, do not justify correction.

In discussing the question of a norm, McCoy[6] has asked, "What standard shall influence us in determining the difference between the anomalous relationships and those to be established?" Many dissimilarities are found among individuals who possess features within the range of normal. An exact ideal or normal does not exist. On the other hand, anyone who attempts to correct or alter facial features must have in mind the condition and appearance to be established.

The real justification for an *"esthetic norm"* is its usefulness. It makes it possible to visualize a problem so that it becomes intelligible, and so that critical judgment may

6. McCoy, J. D.: Applied Orthodontics, ed. 4, Philadelphia, Lea and Febiger, 1935.

be utilized in considering all the factors involved. By its help, we will be better able to see our way through a problem, at least to the extent of having a definite objective in view toward which we may strive (fig. 4).

Any disfigurement of the nose is produced by loss of tissue or by distortion of one or more component parts of the nasal framework from the position normally occupied in relation to the other parts or to the facial surroundings as a whole. In some instances, there may be both loss of tissue and malposition of the segments. Since noses are of infinite variety, it is imperative, when planning the reconstruction and executing the repair, to remember that the final result should be made to blend and harmonize with the configuration of the surrounding head and face, of which the nose is the most important part. Because of the wide normal variation, the correct proportions of a given nose will for the most part depend upon the character of the structures which immediately surround it. The aim of the reconstruction then is not to obtain perfect symmetry, but to bring an abnormality within the range of normal (fig. 9).

The Operation

Safian[7], Sheehan[5], Pickrell[8], Fomon[3] and others have described and illustrated the operative correction of various types of nasal abnormalities. The reader is referred to these articles for details of the operative technique.

In addition to employing the proper technical approach, one must exercise a definite esthetic sense in deciding the extent of the desired change (fig. 2, 3, 5, 7, 8). While a thorough knowledge of the anatomy, physiology, and surgery of the nose is a *sine qua non*, the artistic creative power is the important factor in the success of the operation. It has been said[5], "This esthetic sense can be developed with training and experience if there is an inborn foundation for it; if not, it is as futile as attempting to make a musician of one who is tune deaf."

Summary

In rebuilding or in changing a nose, the plastic surgeon is dealing with material facts related to anatomy and physiology, and with fundamental rules that have been formulated in regard to the proper ensemble of the facial elements. Before deciding to embark upon the project, however, he must also take cognizance of the patient's mental attitude. If it has become warped, it can in the end defeat the main objective—pleasing the patient—regardless of the fact that the reconstructed nose might be surgically and artistically as near perfection as the available material and skill will permit. The psychologic status of patients who seek facial corrections should, therefore, be considered.

Because of the natural prominence of the nose, any nasal deformity is conspicuous. The reconstruction of the defects by those properly trained and qualified offers very little difficulty for the patient, and will in a great many instances result in a greatly improved general appearance. The psychic importance of reconstructive surgery of the nose has been emphasized. A comparatively simple operation, performed under local anesthesia, often relieves the patient of a deformity which has been the source of mental anguish and anxiety. The counsel of "patient resignation" too often given by physicians and friends is unkind and unsound in the light of surgical achievements in plastic surgery.

7. Safian, J.: Corrective Rhinoplastic Surgery, New York, Paul B. Hoeber, Inc., 1935.
8. Pickrell, K. L.: Nasal Deformities and Their Repair, Surgery 20:845-863 (Dec.) 1946.

THE TECHNIQUE OF BREAST FEEDING

FRANK HOWARD RICHARDSON, M.D., F.A.C.P., F.A.A.P.

BLACK MOUNTAIN AND ASHEVILLE

The art of breast feeding is apparently becoming one of the lost arts, so far as a great many American physicians and nurses are concerned[1]. It is not yet a lost art with American mothers, among whom there still exists a vast reservoir of good will toward natural feeding; even here, however, it is losing ground. The policy of a great many physicians—and it is difficult to say whether pediatricians or obstetricians lead in this unscientific attitude—seems to be: Keep hands off until breast feeding has shown itself to be unworkable, and then step in and take over with artificial feeding. When that

Read before the Section on Pediatrics, Medical Society of the State of North Carolina, Pinehurst, May 5, 1948.

1. (a) Sedgwick, J. P. and Fleischner, E. G.: Breast Feeding in the Reduction of Infant Mortality, Am. J. Pub. Health 11:153 (Feb.) 1921.
   (b) Smith, C. H.: The Diet of Young Infants, New York State J. Med. 41:2395-2406 (Dec. 15) 1941.

proves difficult, it is too late to go back to breast feeding.

The paradox here consists in the fact that no physician of standing has ever gone on record as believing that bottle feeding is superior to breast feeding[2]; yet it is unusual to find a doctor who is willing to study seriously the physiology of lactation and suckling, and to learn a tithe as much about breast feeding as he knows about some form of artificial feeding[3].

My firm belief, which is backed by my own experience and by a wealth of authoritative literature, is that the vast majority of American mothers can nurse their babies. Many can nurse them with very little effort, but there are a great many others who will not make a go of it except with informed medical assistance. These mothers need the conscientious supervision of a doctor who has made a close study of the factors involved, and can vary them as skillfully (and as scientifically) as he varies the contents of a formula or changes the prescription of a proprietary infant food.

I began some years ago to collect titles and articles on the subject of breast feeding. So far, I have found more than three hundred contributions[4]. You will, I think, be pleased to learn that divergent and bitterly opposing views have been expressed on every phase of this subject, just as on every other topic that doctors discuss and fight over. This fact raises my hopes for the increasing popularity of breast feeding; for doctors are apt to lose interest in any subject upon which there is anything like universal agreement.

Outline of Technique Employed

Today I propose to outline the technique of breast feeding that I have found effective for the vast majority of mothers. I believe any doctor can make it work—but only after he has modified it to suit each individual case. He can do that only by sitting down with the mother and learning what her problems are.

Prenatal period

Some months before the baby is to be born, the doctor should have a chat with the expectant mother to find out whether she wishes to nurse her baby. I have long since given up crusading at this point. The advantages of natural feeding are presented—its relative ease, inexpensiveness, freedom from worry, and increased liberty for the mother, as compared with the cumbersome, confining, uncertain and expensive features of bottle feeding. It is stressed that the baby benefits from breast feeding both psychologically[5] and by increased resistance to disease[6]. The mother is assured that not she, but her doctor, will be the one to do the worrying. Then she and her husband are left to decide the question. The answer is not often in doubt, if the situation has been presented fairly and honestly.

If the mother decides in favor of breast feeding, her breasts and nipples are examined. If the nipples are inverted, she is taught to pull them out gently and hold them for a few moments three times a day. In any event, she is told to sop them with pledgets of cotton dipped in alcohol, to toughen them for their coming ordeal[3].

Postpartum period

After birth, the baby is put to the breast as soon as the mother's condition permits, and this process is repeated every four hours during the day and every six during the night. No attempt is made at first to do more than accustom him to the procedure; if he doesn't get much, his mother is reassured and told that it makes no difference. It has not yet been proved whether he gets enough colostrum to do him any good[7], but at least we are keeping as close to Nature's plan as we can. Judging by what we know about the salutary effect of colostrum in cow's milk[8] it is at least not unreasonable to assume that the human infant may derive some benefit from his mother's colostrum.

During these early days certain precautions are most important. There must be no so-called "prelacteal feeding"[9] in the mistaken notion that the physiologic loss of weight which occurs in the first week should be lessened. Nothing but water is permitted, and that *after* the baby has nursed, not before.

2. Strong, R. A.: The Decline of Breast Feeding, Internat. M. Digest 34:123-124 (Feb.) 1939.
3. Richardson, F. H.: Simplifying Motherhood, New York, G. P. Putnam's Sons, 1925.
4. Richardson, F. H.: Breast Feeding Comes of Age, in preparation.
5. Childers, A. T. and Hamil, B. M.: Emotional Problems in Children as Related to the Duration of Breast Feeding in Infancy, Am. J. Orthopsychiat. 2:134-142 (April) 1932.
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9. Brennemann, J.: Dr. Brennemann's Notes on Infant Feeding, Maternal and Artificial, Butler, Indiana, H. R. Farnham, 1919.

Neither must any attempt be made to lessen the mother's moderate degree of discomfort attendant to the "coming in" of the milk. There must be no laxatives, no tight binding of the breasts—nothing more than a temporary limitation of fluids. Otherwise the oversupply of milk will quickly be succeeded by a deficiency. Nature is never wasteful, and she coordinates the supply with the demands of the infant, provided this automatic adjustment is not tampered with.

The mother must be taught to use *both* breasts at each feeding, alternating their order, and being sure to empty the first one completely each time. While it is the custom of many nurses and many hospitals to permit the use of only one breast at a nursing[10], few mothers have enough milk to use but one breast at a feeding[11]. The nursing time should be limited only by the necessity of conserving the nipples. The time-honored twenty-minute nursing period is distinctly "out," in spite of the published reports that the baby gets most of his supply during the first two to eight minutes[1b].

Critical periods

Every mother should be forewarned that there are certain critical periods when breast feeding trembles in the balance. These occur when she first sits up in bed, when she first gets out of bed, when she goes home from the hospital, when she first attempts to resume housekeeping—in fact, whenever she takes up additional duties that tire her. It is fatigue that cuts down milk supply, and not the mother's failure to stuff herself. She may eat as much or as little as her appetite dictates, provided only that she takes a quart of the best milk obtainable every day, and drinks a glass of water half an hour before each nursing[12].

Breast feeding is also threatened when the mother loses fluid from her body, as when she perspires freely, when she has a slight diarrhea, and when menstruation is re-established. (When so-called "menstrual milk" produces "colic," it is because its scantiness[13] causes hunger, and for no other reason.) What shall she do at such times—or at any other times when she has the slightest doubt that the baby has taken enough to satisfy him?

Complementary feeding

The offering of a "complementary" or completing feeding at such times, using for this purpose whatever artificial feeding the doctor would ordinarily prescribe for a baby of the same age and size who had to be weaned, gives the youngster an opportunity of making up for any lack of supply on his mother's part. This may be employed at any time—even during the first few days (after the colostrum has been succeeded by milk) if the secretion of true milk starts slowly or if it seems inadequate. Complementary feeding must be offered only *after* the breasts have been emptied by the baby; if it is given *before*, he is very likely to fail to supply the stimulation of sucking necessary to maintain adequate milk secretion.

What about the danger of overfeeding—that bugbear we were taught as medical students to fear, with its diagnostic signs of vomiting, "colic," flatulence, bad stools, eczema, and too rapid gain in weight? Frankly, I am convinced that it just cannot be done, with all due respect to the authorities who say that it occurs frequently. If you have the patience and know-how to persuade a nursing baby to take more food than he wants, then you are a better man than I am. Even if you should succeed, the baby always has the last word, and can regurgitate any overplus. (Any time he spits up, by the way, for any reason except real illness, he should be permitted and even encouraged to begin his whole meal right over again, if he will do so. Regurgitation in an infant is accompanied by no nausea; he "swallows up" almost as readily and with as little effort as he "swallows down.") I believe that a few such trials will convince the unprejudiced observer that it is impossible to overfeed the nursing infant. Yet it is only fair to state that Charles Hendee Smith believes the reverse to be the case[1b].

"Gas" and colic

How about "gas"? There is no such thing as gas from indigestion in the baby fed on his mother's milk. To be sure, he may gulp down enough air to fill up his stomach and so reduce his capacity for food before he has

10. Witkin, M.: Newer Concepts of Breast-Feeding. Brit. M. J. 1:441-442 (Mar. 31) 1945.
11. Turner, M. L.: Some Observations from Nature. Tr. Sect. on Diseases of Children of A.M.A., 1923.
12. Richardson, F. H.: Critical Periods in Breast Feeding, Hygeia 20:224-226 (Mar.) 1942.
13. Grulee and Caldwell, however [Grulee, C. G. and Caldwell, F. C.: The Influence of Menstruation on Breast-Milk. Am. J. Dis. Child. 9:374-380 (May) 1915] found "a period of increase beginning with the first day of menstruation and lasting from 10 days to 2 weeks thereafter. Then there occurred a diminution . . . which reached its lowest point 4 to 7 days previous to menstruation after which there was a gradual increase."

taken enough to carry him over until his next feeding. The x-ray pictures of Smith and LeWald demonstrate this occurrence beautifully[14]. To obviate it, most mothers are familiar with the process inelegantly known as "burping" or "bubbling." This consists in placing the infant over the shoulder or on the knee and patting him, none too gently, on the back until the bubble of air (which is *not* "gas" from indigestion, as it is so often assumed to be) escapes. Inasmuch as this procedure makes more room in the stomach, the baby should be put back on the breast and allowed to fill the space thus made available.

Colic can usually be explained on the basis of hunger, provided it is not confused with the very agonizing colicky cramps of intussusception, or perhaps with the pain of appendicitis. As these conditions have other diagnostic signs, there is not much excuse for mistaking them for "colic."[11] The cure of colic consists usually in giving more food —though this statement, like most of the others made here, has its vigorous dissidents as well as its strenuous defenders.

A device that has proved very helpful when the baby is not getting enough milk to carry him over the four-hour interval until the next feeding is stool training as an adjunct to nursing[3]. While modern psychologists object strenuously to any form of bowel training, it has been my experience that most babies easily fall into the habit of a regular evacuation before, during or after each feeding. The easiest way to establish this habit is by inserting a small soap stick into the rectum after each feeding, and then placing a small "lap chamber" against the baby's buttocks as he lies on his back in his mother's lap or on a table. Usually the soap stick is necessary only for a day or two. After the evacuation has made more intra-abdominal space available, the baby is put back on the breast and frequently gets a sizable increment of milk.

Feeding intervals

What about so-called "self demand"? A great deal has recently been made of this reversion to the bad old days when the baby pulled at his mother's dress whenever he wanted a nip, and kept her his slave for nine months, with never a minute's peace day or night. Most of us have obtained the good effects of this custom, without making the mother suffer from its obvious drawbacks, by permitting a reasonable latitude about her nursing hours. If she finds the baby unable or unwilling to go on a four-hour schedule at any time, the three-hour schedule may be substituted until he can be induced to take enough to carry him over the longer interval.

The 10 p.m. and 2 a.m. feedings can be combined advantageously by letting the child sleep after his 6 p.m. feeding until he wakes of his own accord—probably around midnight. He will probably give up his night feedings entirely around the end of the second month, if not earlier, provided he is getting enough to satisfy him.

Manual expression

No presentation of the subject of breast feeding would be complete that did not describe manual expression. This is emptying the breast by means of the best breast pump there is, the human hand[15]. The following method, which has been described by Dr. J. P. Sedgwick, should be taught all mothers.

"The breast is grasped about 1 or 2 cm. back of the colored areola, and a milking motion is carried out toward the nipples . . . No massage of the breast proper is allowed . . . The ducts which contain the milk extend but a short distance back of the areola. Any one who has ever seen a cow knows that the teats are milked and not the cow's bag."[16]

Conclusion

How many babies can be breast fed, and for how long? Statistics are available from demonstrations for those who want them[17]. My own experience, however, as well as the experience of many others who have taken breast feeding seriously enough to learn a technique for obtaining it, encourages me to believe that the vast majority of infants can be carried through the period of infant feeding on the breast. In most cases where breast feeding fails, it is the doctor who is at fault.

Discussion

Dr. McQueen Salley (Hendersonville): Since Dr. Richardson has invited me to disagree with him wherever possible, I shall take exception with him on the question of gas or air. I do not believe the

14. Smith, C. H. and Le Wald, L. T.: The Influence of Posture on Digestion in Infancy, Am. J. Dis. Child. 9:261-282 (Apr.) 1915.

15. Davies, V.: A Simple Technic for the Manual Expression of Mothers' Milk, Am. J. Dis. Child. 70:148-149 (Sept.) 1945.

16. Sedgwick, J. P.: Establishment, Maintenance, and Reinstitution of Breast Feeding, J.A.M.A. 69:417-418 (Aug. 11) 1917.

17. In Nassau County, New York, nine tenths of the mothers nursed for one month and two thirds for seven months (Richardson, F. H.: Universalizing Breast Feeding in a Community, J.A.M.A. 85:668-671 (Aug. 29) 1925); in Cortland, New York, 77 per cent nursed for nine months (Annual Report of the Division of Maternal, Infant, and Child Hygiene of the State of New York for the year 1926, p. 76).

nursing baby ever swallowed air. I do know that the action of dilute hydrochloric acid on certain liquids does produce gas, and that is what happens with the nursing baby. I am convinced also that indigestion causes the green stools so frequently seen. As to an ironclad nursing interval, I never insist upon this. If the baby gets hungry before three hours, I permit him to nurse after two and one-half hours.

Dr. Richardson: I am going to ask Dr. Salley, who is an expert radiologist, to see if he can disprove the contention of Dr. Hendee Smith and Dr. LeWald, whom I quoted in my text. Their pictures show conclusively the occurrence of a large bubble of air in a baby swallowing in the prone position. I do not consider green stools significant in the nursing infant. I agree with Dr. Salley that the baby should determine his nursing interval; but if he gets enough he will usually go four hours.

Dr. Roy Smith (Greensboro): What foods should be denied the nursing mother?

Dr. Richardson: She can take any food which does not cause indigestion in herself.

Dr. Aldert S. Root (Raleigh): I sometimes find inverted nipples in infants. When this occurs, I instruct the mother to use gentle pressure to pull them out, so that when they grow up they may nurse their babies.

Dr. LeRoy Butler (Winston-Salem): What do you do for colic? Also will you tell us how frequently you succeed in keeping your babies on the breast?

Dr. Richardson: In my experience "colic" is almost always another name for hunger, although Dr. LaBruce Ward disagrees. Dr. Ward believes that many babies are hypertonic and have colic due to their heightened irritability.

As to the percentage of babies I am able to keep on the breast, I rarely fail if I have a mother and baby from birth. When I do fail, it is almost always because the mother, the attending obstetrician, or the family doctor is openly or covertly opposed to breast feeding.

Dr. Samuel F. Ravenel (Greensboro): It is gratifying in these modern days to discover that a woman's breasts have a utilitarian purpose. A few of the women that I encounter in my practice are able and willing to nurse their babies. Most of these are phlegmatic, rather bovine-type farm women with vigorous, ravenous infants and with husbands who are stone deaf. The majority of mothers, I regret to say, cannot nurse their infants. Frank talks about the sin of driving babies to the bottle. In my experience, women who are forced to nurse their babies are often driven to another kind of bottle by the baby's constant screaming. Seriously, it does seem to me that, of the women who conscientiously try to nurse their babies, the majority fail.

Dr. Richardson: The attending physician who is not completely convinced of the feasibility as well as the advantages of breast feeding will have difficulty in selling the article on which he is not himself sold. I will admit that many women consider they will be hampered and restricted if they nurse their babies. I believe it is the duty as well as the privilege of the physician to make breast feeding less confining than artificial feeding.

Dr. J. LaBruce Ward (Asheville): This is a very important paper, and I agree with it in part. I don't agree, however, that a soap stick should be used to make the baby have a movement.

I believe that the factor which has contributed most to the failure of mothers to nurse their babies, for the past ten or fifteen years, is prelacteal feeding, which we should all oppose.

I think the doctor is largely to blame for not making mothers nurse their babies. In my experience, at least, the baby is not considered as belonging in the domain of the pediatrician until the neonatal period is past. Frequently the pediatrician is called in when a baby is three or four days old, after he has already been put on a bottle and his mother has been given stilbestrol.

Breast feeding gives the baby a sense of belonging to the mother, a sense of security, which he does not have when he is on the bottle. I explain the advantages of breast feeding to the mother, and if she refuses to try it, I decline to treat the baby.

Dr. Richardson: I admire Dr. Ward's courage, but I have given up trying quite so hard to convert mothers to breast feeding. If they are willing to do their best, I can always promise them success; but such willingness on the mother's part is almost essential to the maintenance of breast feeding.

TREATMENT OF SIMPLE FRACTURES OF THE SHAFT OF THE FEMUR BY A FIXED TRACTION SPICA

A Preliminary Report

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Immobilization of fractures of the shaft of the femur by a method incorporating traction and countertraction into a single or double hip spica has been employed by the senior author for many years, with good results. It has been used in all age groups and both sexes. The advantages of this method are that it obviates the necessity for skeletal traction and long hospitalization.

Throughout this paper the term "fixed traction spica" will be used to indicate the apparatus described herein.

Method

Premanipulative phase

Patients admitted to the hospital with simple fractures of the femoral shaft are seen first in the emergency room, where a Thomas leg splint is applied. A limited physical examination is made, and sedatives and analgesics are administered. Shock therapy is given if necessary. Later such patients are moved to the x-ray room on the rolling ambulance litter and carefully lifted to the x-ray table, a member of the orthopedic house staff supervising the handling of the patient.

After satisfactory anterior-posterior and

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lateral x-ray films are obtained, the patient is usually transported to his room, where the Thomas leg splint is removed and adhesive traction applied. The leg is placed on a flat pillow, with the heel extending beyond the pillow edge, and is immobilized with sandbags along either side. Approximately 10 pounds of weight is applied to the extremity. The necessary laboratory examinations are made, and a thorough physical examination is done, care being taken to maintain traction and immobility of the affected leg. The foot of the bed is then raised on low shock blocks (4 inches) so that the body may act as countertraction. If both femurs are fractured, adhesive traction is applied to each lower extremity and the foot of the bed is raised higher to afford more countertraction.

Adhesive traction is applied by the following method: The leg, if hairy, is shaved and painted with tincture of benzoin. Three-inch-wide adhesive tape is then used to strap a wooden spreader block to the leg, about 2 inches below the foot. This tape is carried up both sides of the leg at least as far as the mid-thigh. The spreader block is placed close enough to the plantar surface of the foot to aid in maintaining dorsiflexion. A short, three-inch-wide piece of tape covers the proximal side of the spreader block and the adhesive side of the tape over the malleoli. If the spreader block is wide enough and the adhesive tape properly placed, there will be no irritation of the malleoli. To add further protection, the ankle may be wrapped loosely with wide gauze bandage before application of the adhesive tape. One-inch-wide adhesive tape, previously unrolled, is applied carefully but loosely in a widely spaced spiral from about two inches above the malleoli to the mid-thigh. Care is taken to avoid the head of the fibula and the patella when applying the one-inch adhesive tape. This adhesive traction is to be incorporated later into the spica. Skin traction has proved to be adequate, and skin irritation has not been a complication.

Manipulative phase

Usually the patient is completely evaluated by the morning after admission. He is then transported to the orthopedic room, and after the administration of an anesthetic is placed on the fracture table. The lower extremities are in moderate abduction, traction is made on both ankles, and the knees are slightly flexed.

The ankles are wrapped in sheet wadding cotton, over which wide muslin bandage is applied in a double half-hitch manner and tied to the foot pieces with the feet at 90 degrees dorsiflexion. The spreader block and adhesive tape distal to the ankle and not adherent to it are pushed out of the way posteriorly. Any necessary traction and manipulation are now carried out, and the alignment is checked fluoroscopically until satisfactory reduction is accomplished.

A generous amount of sheet wadding cotton is used to pad the lower abdomen, pelvis, and hips, as well as the unaffected thigh down to the knee and the affected thigh down to the ankle. Additional pads of cotton or felt are used to pad the trochanteric regions and the crests of the ilia.

Eight-inch, slow-drying plaster is used to place a pelvic band over the sheet wadding. The upper edge of this band is usually located at the umbilicus. Usually two rolls are utilized in this step. Next perineal straps (made by sewing together two pieces of muslin about three inches wide and thirty-six inches long, stuffed with cotton, and pressed flat[1]) are snugly applied up over the plaster pelvic band anteriorly and posteriorly. The perineal straps must be applied tightly and pulled upward and outward against the junction between thigh and buttock at an angle of about 45 degrees. Each strap is held under tension by an assistant, and the ends are parallel and well above the upper edge of the plaster pelvic band. Additional plaster is applied to the band to cover the straps, and the ends are then turned down and covered with more plaster. This step establishes the countertraction for the femur.

Slight flexion of the knees is attained by carrying three- or four-inch gauze bandage under the knee outside the cotton padding and up to an overhead horizontal bar.

Six-inch, slow-drying plaster is wrapped around both thighs to just above the knees in a circular and figure-of-eight manner. The inguinal regions of the spica are reinforced with plaster slabs bilaterally. A wet plaster slab (one roll) is now placed between the gauze suspension from the inguinal region of the affected thigh over the anterior aspect of the knee to the mid-tibial region.

1. The perineal straps are fashioned after the Taylor hip splint used for the treatment of tuberculosis of the hip.

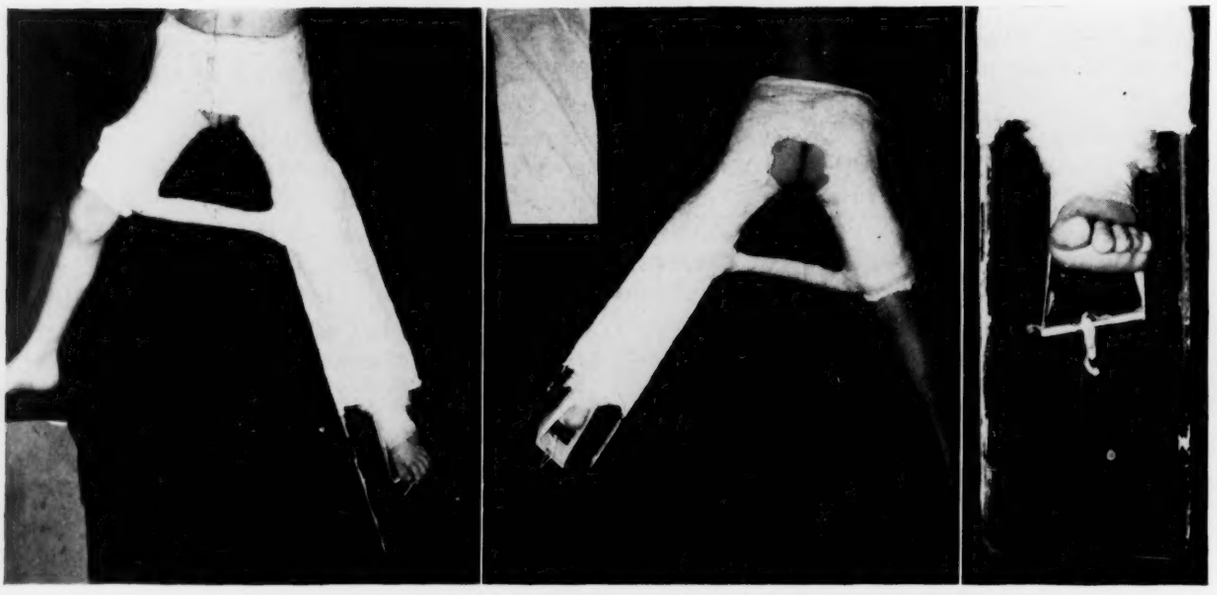

Figure 1

An iron rod, bent into a rectangular shape and open at one end, is held by an assistant, while wet plaster is loosely draped over the lower parts of the parallel bars to form a sling supporting the padded calf of the affected leg. This rod reaches from mid-thigh to approximately six inches beyond the foot piece of the table. The upper or open ends of the rod are solidly incorporated into the portion of the spica above the knee by the addition of more plaster. Now a thin layer of plaster is applied over the lower part of the parallel rods, snugging down the draping plaster ends of the sling as well as covering the anterior plaster slab from the knee down to the low tibial region.

After the plaster has become firm, the ankle traction straps and padding on the affected side are carefully removed. At the same time the traction on the unaffected side is reduced, but this foot remains bound to the foot piece of the table.

The rope through the middle of the spreader block of Buck's extension is now wrapped around the block in an anterior-posterior direction one and one half times, and tied where the rope comes through the hole. Two long, three-inch-wide strips of automobile innertubing are carried between the rope and the spreader, one on either side of the hole (one strip anterior to the hole and one posterior). The ends of the rubber strips are pulled over the closed end of the rod and tied under the desired tension in square knots. A safety pin is run through both ends of each rubber strip just distal to

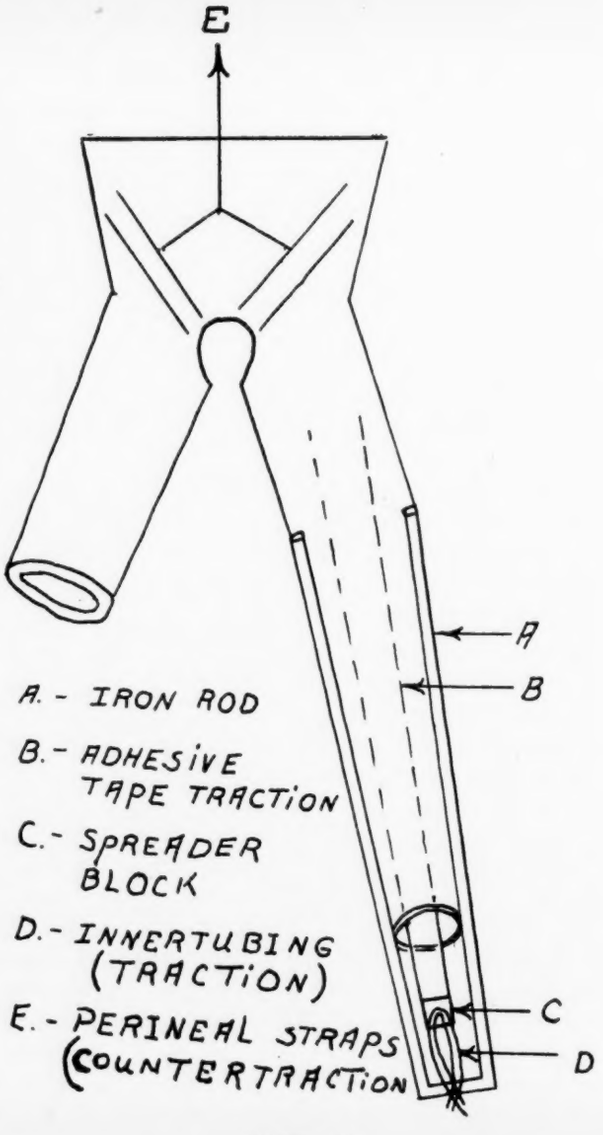

Figure 2

the knot to prevent slipping.

A crossbar of plaster is applied between the thighs just above the knees and bowed anteriorly to facilitate placement of a bedpan. The bar also affords a grasping point to facilitate turning the patient.

By this time the plaster is sufficiently dry to remove the wide gauze bandage suspending the knees. It is loosened by a see-saw motion and one side is cut where it enters the plaster; it is then pulled out the other side. Care must be exercised to remove this piece of material without breaking it; if allowed to remain in place, it may cause pressure against the popliteal region.

The pubic region of the spica is trimmed and the unaffected lower extremity is released from the foot piece of the table. When the fixed traction spica is deemed dry enough, the patient is transferred to a rolling litter in the prone position, face to the side, so that the gluteal region of the spica may be trimmed. Laterally the visible portions of the perineal straps form the margins and prevent the plaster from rubbing the skin of the buttocks.

When both femurs are fractured, a double fixed traction spica is applied. Both lower extremities are put up in fixed traction, with the usual two perineal straps acting as countertraction.

Postmanipulative phase

The patient, attended by an anesthetist, is transported to his room, where a heat cradle is placed over the spica. The following day anterior-posterior and lateral x-rays are taken to check the position of the fragments. At this time correction in the amount of traction may be made if necessary. Wedging of the spica, although not employed in the cases to be reported, may be done if necessary.

After the fracture is considered in satisfactory position, the plaster thoroughly dry, and the general condition of the patient satisfactory, he may be discharged home, to return to the office or clinic in about one month for a repeat x-ray examination. If x-ray films are satisfactory, the patient is encouraged to contract, voluntarily and periodically, the quadriceps and hamstring muscles of the completely immobilized lower extremity. At the end of six to eight weeks (from the time of reduction) for young children, ten to twelve weeks for adolescents, and about sixteen weeks for adults, another visit is made. At this time a window is cut out over the fracture in the anterior part of the spica, and films are made. If these show the fracture well healed, the spica is removed.

Following removal of the spica, a regimen of physiotherapy to be carried out in the home or outpatient department is outlined. The patient is taught to walk with the aid of crutches, then with a cane until the muscles are strong enough to permit unaided weight-bearing.

Comparison with Other Methods

The fixed traction apparatus described above differs from Hoke's traction apparatus in that the latter incorporates the entire leg and foot of the unaffected side in plaster; hence traction on the affected side produces countertraction against the sole of the foot of the unaffected side. In the apparatus presented here countertraction is made possible with perineal straps, and the unaffected limb is free from the knee down.

The method also differs from Roger Anderson's well-leg traction, since the latter does not include the pelvis in plaster but again utilizes countertraction in the well leg by means of a metal stirrup incorporated in plaster and attached to a Kirschner wire or pin through the lower end of the tibia of the affected side.

Review of Thirty-One Fractures Treated by This Method

Age and sex distribution

The series of cases upon which this report is based is made up of 31 fractures occurring in 28 patients. The ages of the patients ranged from 9 months to 93 years (table 1). Twenty of the patients were males and 8 were females—a ratio of 2:1.

Table 1

Age Group	*No. Patients*
Less than 2 years	3
3-15 years	15
16-20 years	1
21-80 years	4
Above 80	2
Total	28

Types and locations of fractures (tables 2 and 3)

All cases presented were fresh fractures except two. In one of these, seen two and a half months after injury, callus formation had taken place, but malunion was present. In the other, seen five weeks after injury,

Table 2
Types of Fractures

	Displaced	*Displaced-Comminuted*	*Undisplaced*	*Total*
Transverse	17	1	2	20
Oblique	4	3	1	8
Spiral	2		1	3
Total	**23**	**4**	**4**	**31**

Table 3
Location of Fractures

Location	*No. Cases*
Upper third	6
Junction of upper and middle thirds	2
Middle third	11
Junction of middle and lower thirds	6
Lower third	6
Total	**31**

displacement of the fragments had occurred. Twenty-three fractures—about two thirds of the series—were displaced. Four fractures were displaced and comminuted. The most common type of fracture was a transverse displaced fracture in the middle third. In only 2 cases were accompanying tibial fractures present. Three cases were bilateral fractures of the femoral shafts.

Length of hospitalization and results of treatment (table 4)

Four patients (1 infant and 3 children) were treated as outpatients. One patient with bilateral femoral shaft fractures, a right tibial fracture, and a displaced upper right femoral epiphysis was hospitalized fifty-seven days. The average period of hospitalization for all cases was nine days. More than half of the patients were hospitalized one week or less.

In this small series of 31 fractures of the femoral shaft, none of which were compound, satisfactory healing was obtained in all cases except that of one aged patient who died on the seventh postmanipulative day in congestive heart failure. This patient was 93 years old. One 86-year-old female obtained satisfactory healing of the fracture but never was able to walk unaided. Three cases required open reduction. One patient, a 17-year-old girl in whom the spica was removed nine weeks after reduction, refractured her femur in bed while being assisted on a bedpan.

Other Uses of the Method

Although it is not within the scope of this paper to report results following the use of the fixed traction spica in other orthopedic conditions of the hip and femur, nevertheless we wish to impress the reader with the

Table 4
Average Results by Age Groups

Age Group	*Time Required for Healing (Determined by X-Ray)*	*Time Required for Unaided Self-Locomotion*
Under 2 years	36 days	49 days
2-5 years	1.58 months	2.13 months
6-10 years	2.50 months	3.30 months
11-15 years	2.66 months	4.66 months
16-20 years	3.95 months	5.18 months
21-80 years	3.5 months	6.00 months

versatility of the apparatus. It has been used with success in the following conditions:

1. Simple fractures of the femoral shaft.
2. Slipped femoral epiphysis—conservative treatment or prior to reduction and internal fixation.
3. Tuberculosis of the hip—conservative treatment or prior to fusion.
4. Osteomyelitis of the femoral head, neck, and acetabulum. The fixed traction spica is an adjunct to treatment, since it immobilizes the part, gains leg length where there is destruction of bone, and in time permits evaluation of new bone formation with the part at rest.
5. Undisplaced fracture of the femoral neck.
6. Intertrochanteric fractures when operation is contraindicated.
7. Intracapsular femoral fractures.
8. After open reduction with screw fixation.
9. Pathologic fracture of the femur.

Summary

1. A series of 31 fractures of the shaft of the femur treated by closed reduction and fixed traction are presented as a preliminary report.
2. Satisfactory healing was obtained in all cases except one (a 93-year-old woman who expired on the seventh day).
3. We believe that the healing time was not increased by the use of this method of treatment.
4. The average period of hospitalization was nine days.
5. Expense to the patient and institution is minimal.
6. The dangers accompanying open reduction or skeletal traction are avoided.

Conclusions

We realize that similar results can be obtained by more than one method of treatment, and do not intend to leave the impression that this method is the best. However, bed space is limited in many institutions,

and this method affords a short period of hospitalization for the majority of cases. In our hands results seem equally as satisfactory as with other methods requiring much longer hospitalization.

THE EFFECT OF TOBACCO ON ESTRUS, PREGNANCY, FETAL GROWTH, AND LACTATION

A Critical Review of the Literature

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The attempt to demonstrate toxic effects of tobacco in its various forms is as old as the history of its use. In the earlier medical literature it was both condemned and acclaimed, being described as deleterious to digestion and sexual desires, but recommended in the treatment of catarrh, hemorrhoids, and hydrocephalus[1].

During recent years, a vast amount of conscientious work has been done in an attempt to demonstrate the effects of tobacco and its constituent, nicotine, on the human organism. Numerous investigators have studied its effect on the cardiovascular, gastrointestinal, respiratory, and central nervous systems. The measurable effects on mental and physical efficiency have also been recorded.

The past two decades have seen tobacco production and consumption grow by leaps and bounds. Since a large part of the increase in consumption is attributed to the woman smoker[2], considerable research has been directed to the possible toxic effects of nicotine on certain physiologic processes of the female—namely, estrus, pregnancy, fetal growth, and lactation. This research, both experimental and clinical, is reviewed critically in the present report, which is intended as an introduction to clinical studies to be published in the future.

Numerous animal experiments have been carried out to obtain information which might have some bearing on the use of tobacco by the pregnant or lactating woman. However, in the interpretation of data thus obtained, many authors have ignored certain basic differences between animal and human subjects, such as (1) the relative dose of nicotine as milligrams per kilogram of body weight, (2) the mode and rate of nicotine administration, (3) the matter of tolerance or habituation to nicotine, (4) species differences in the response to nicotine.

The amount of nicotine consumed and the rate of consumption during cigarette smoking vary with several factors, including composition of the cigarette, speed of smoking, temperature of the smoke, fraction of the cigarette smoked, and the amount of smoke inhaled[3]. Under the usual conditions for smoking, it may be assumed that a smoker absorbs approximately 3 mg. of nicotine from one cigarette in a smoking period of five to ten minutes. For a woman weighing 60 Kg. (132 pounds), this is a dose of 0.05 mg. of nicotine per kilogram, administered at a rate of 0.005 to 0.01 mg. per kilogram per minute. The moderate smoker who uses ten cigarettes per day absorbs a total of 0.5 mg. of nicotine per kilogram in ten separate doses distributed over a ten- to fifteen-hour period. This dose and rate of administration is only a small fraction of that used in the majority of animal experiments reported to date.

Information on tolerance and species differences among animals is limited to a few scattered observations.

Effect on the Estrus Cycle

Various methods and species of animals have been used in an attempt to demonstrate a direct or indirect effect of nicotine on the estrus cycle. The earliest experimental work was that of Ogata[4]. He was unable to demonstrate by careful macroscopic studies any pathologic changes in the ovaries of sexually mature young rabbits injected with a physiologic saline extract of cigar smoke. Histologic studies were not done. Thienes and Behrend[5], using injections of a 0.1 per cent

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This study was made possible by a grant from the Medical Relations Division of William Esty and Company, Inc., of New York.

1. (a) Willich, A. F. M.: Lectures on Diet and Regimen, ed. 2, Boston, Joseph Nancrede, 1800. (b) Darwin, E.: Zoonomia; or the Laws of Organic Life, ed. 3, Boston, Thomas and Andrews, 1809.
2. Thompson, W. B.: Nicotine in Breast Milk, Am. J. Obst. & Gynec. 26:662-667 (Nov.) 1933.
3. Bogen, E.: Composition of Cigarets and Cigaret Smoke, J.A.M.A. 93:1110-1114 (Oct. 12) 1929.
4. Ogata, S.: Preliminary Report of Studies on the Influence of Alcohol and Nicotine upon the Ovary, J. M. Research 40:123-127, 1919.
5. (a) Behrend, A. and Thienes, C. H.: Chronic Nicotinism in Young Rats and Rabbits; Effect on Growth and Estrus, J. Pharmacol. & Exper. Therap. 46:113-124 (Sept.) 1932; (b) Thienes, C. H.: Failure of Nicotine to Alter Estrus Cycle in White Rat, Proc. Soc. Exper. Biol. & Med. 28: 740-741 (April) 1931.

solution of pure nicotine, in a dose of 5 mg. per kilogram twice daily, failed to produce any changes in the estrus cycle of white rats. The cycle was closely followed by daily vaginal smears.

According to Campbell[6], Unbchan and Nakasawa reported that nicotine causes the ovaries of white mice to cease their production of the estrogenic-producing hormone. Nakasawa further observed that atrophy of the ovaries, uterus, and vagina took place, and that continued injections of nicotine prevented the occurrence of pregnancy. Lee[7] found that daily nicotine injections into white mice stopped the estrus cycle and produced atrophy of the vaginal mucosa and endometrium, with hyperplasia of the vaginal submucosa. He also noted rapid ripening of the graafian follicles followed by cloudy degeneration, indicating that nicotine first stimulates but later inhibits ovarian activity. In one group of animals an injection of luteohormone or anterior pituitary extract, given concomitantly with the nicotine, markedly inhibited the changes just described.

Winkler and Fenner[8], reporting on clinical studies among women workers in tobacco factories, noted a high percentage of delayed menarche, early menopause, menstrual disturbances, dysmenorrhea, and endometritis. These investigators also substantiated the experimental evidence of Lee as to the inhibition of nicotine by luteohormone, and concluded that female animals have a much higher resistance to nicotine intoxication than do males. Myers, however, quoting numerous opinions and without presenting clinical or experimental data, concluded that "according to reports the female is injured more than the male."[9]

Wilson and De Eds[10] found that when healthy female rats were fed a diet containing 0.025 per cent nicotine, which gave them a daily dose of 12 to 15 mg. per kilogram of body weight, the menses became irregular. When the nicotine dose was doubled, the food intake was reduced and the normal menstrual rhythm stopped completely in three days. A control group was placed on an insufficient diet without the addition of nicotine. The menstrual cycle stopped in eight days—an indication that malnutrition in experimental animals may be a factor in explaining the divergent results reported by different investigators. This observation suggests that the alleged effect of nicotine on the menstrual cycle may be the result of an inadequate diet.

Effect on Pregnancy and Fetal Growth

A great deal of work has been directed toward the establishment of an antepartum regimen free from any deleterious influence on the mother or fetus. This has led a number of workers to investigate the possible effect of cigarette smoking on pregnancy. Chiasson[11] found exceptionally high fertility and abundant lactation in a group of French women who were habitual pipe smokers. A somewhat analogous observation has been made in experimental animals[7].

Essenberg, Schwind, and Patras[12] used two procedures for demonstrating the effect of nicotine on the offspring of albino rats. One group of pregnant rats was placed in an atmosphere of cigarette smoke for three minutes daily. The other group received a daily subcutaneous injection of 0.5 to 1.0 cc. of a 1:1000 nicotine solution. This dose, probably 1.5 to 3.0 mg. per kilogram of body weight, produced characteristic nicotine convulsions within one minute of injection. Two thirds of the offspring from both groups were underweight, because of the absence of the normal body fat. There was no marked effect on skeletal growth—a fact previously observed by Behrend and Thienes[5a]. Of the females injected with nicotine, 63.3 per cent lost one or more of their young before weaning, and 33.3 per cent lost all of their young; in a control group which had not received nicotine in any form only 23.3 per cent lost one or more of their young before weaning. Individual variation was considerable. Even though these authors stated that they subjected rats "to tobacco smoke that would approximate human smoking of about a package of cigarettes per day," a daily three-minute exposure to smoke cannot be consid-

6. Campbell, A. M.: Excessive Cigarette Smoking in Women and Its Effect upon Their Reproductive Efficiency. J. Michigan M. Soc., 34:146-151 (March) 1935.
7. Lee, Y. C.: Experimental Studies on the Relation between Nicotine and Sexual Hormone, J. Severance Union M. Coll. 2:108-158, 1935.
8. Winkler, H. and Fenner, R.: Inwieweit beeinflussen die Sexualhormone die Nicotintoxizität. Klin. Wchnschr. 21: 1034-1037 (Nov.) 1942.
9. Myers, J. L.: Influence of Smoking on Health. Tr. Am. Laryng. A. 62:340-356, 1940.
10. Wilson, R. H. and De Eds, F.: Nicotine Toxicity: Effect of Nicotine-Containing Diets on Estrus Cycle. J. Pharmacol. & Exper. Therap. 59:260-263 (March) 1937.
11. Chiasson, M. J., cited by Johnson, W. M.: Effects of Tobacco Smoking, Correspondence, J.A.M.A. 93:1909 (Dec. 14) 1929.
12. Essenberg, J. M., Schwind, J. V., and Patras, A. R.: Effects of Nicotine and Cigarette Smoke on Pregnant Female Albino Rats and Their Offspring. J. Lab. & Clin. Med. 25:708-717 (April) 1940.

ered identical with human smoking, either as to the nicotine dose or as to rate of absorption.

In a somewhat similar experiment, Schoeneck[13] blew the smoke of one cigarette into the nostrils of a rabbit each day. The weight of the offspring from rabbits exposed to smoke was approximately 17 per cent less than the weight of those in the control series, and the stillbirth rate was ten times greater than that in the controls. This author assumed that the nicotine dose given to the rabbit was equivalent to that taken by a human being who smokes twenty cigarettes per day; but he overlooked the difference in the mode of administration. The human smoker receives twenty separate doses, each of about 0.05 mg. per kilogram, while the rabbits received in a single dose relatively twenty times the amount of smoke taken at one time by the human being, and presumably twenty times the amount of nicotine.

Mgalobeli[14], on the basis of limited clinical data, concluded that among women who work in tobacco factories there are fewer pregnancies, more abortions, and a greater infant mortality rate in the age group from 1 to 3 years. Campbell[15] is of the opinion that excessive smoking, in a small proportion of maternity cases, has a detrimental effect on the patient's general health. He reported on an analysis of replies from seventy-five members of the American Society of Obstetrics and Gynecology, whose opinions strongly indicated that smoking, except in moderation, is unfavorable to the health of expectant mothers. The same author, however, was unable to demonstrate any histologic changes in the ovaries and uteri of 2 healthy female rabbits which had received 10 mg. of nicotine intravenously or 40 mg. subcutaneously three times each week for nine months.

Proof that nicotine crosses the placental barrier is lacking. Sontag and Wallace[16] found that the fetal heart rate was increased by about 5 beats per minute after the mother had smoked a cigarette. The recordings were made by auscultation, however, and the differences observed may be due to individual error. Five subjects were used, one being a non-smoker. In this last case, a decrease in the fetal heart rate was recorded. The increase of rate in the smokers, the authors felt, was suggestive that nicotine crosses the placental barrier. There is a possibility that this deduction may be correct, as smoking produces an increase in the heart rate of the adult[17].

Effect on Lactation

In a very careful study, Hatcher and Crosby[18] have shown that massive doses of nicotine inhibit lactation in cats for about six hours. Regardless of the dose, no toxic symptoms could be produced in nursing kittens and no permanent effects on lactation could be demonstrated. These authors found that 5 mg. of nicotine per kilogram, given in four doses over a period of two and one-half hours, made a cow sick and suppressed lactation for several hours. The next day—twenty hours after the last nicotine dose—the cow appeared normal and the milk flow was normal. This dose of nicotine is massive and would correspond to that obtained by smoking 100 cigarettes in two and one-half hours.

In a report to Hatcher[18], members of the Department of Obstetrics and Gynecology of Cornell Medical College stated that they had not observed that smoking decreased lactation or had any effect on the nursing infants. Perlman and Dannenberg[19] recorded similar findings in human mothers. A definite correlation was noted between the number of cigarettes smoked and the quantity of nicotine excreted in the milk and urine, but no effect on the nurslings was demonstrated. It was suggested that a tolerance to nicotine on the part of the infants may explain the lack of toxic symptoms. In this connection it is worth noting that young rats develop a marked resistance to the convulsive action of nicotine, while adults do not[20].

Other studies on the nicotine content of milk have been reported. Thompson[2] concluded that one of his patients eliminated in her milk 0.06 to 0.24 mg. of nicotine in a

13. Schoeneck, F. J.: Cigarette Smoking in Pregnancy, New York State J. Med. 41:1945-1948 (Oct. 1) 1941.
14. Mgalobeli, M.: Einfluss der Arbeit in der Tabakindustrie auf die Geschlechtssphäre der Arbeiterin, Monatschr. f. Geburtsh u. Gynäk. 88:237-247 (June) 1931.
15. Campbell, A. M.: Effect of Excessive Cigaret Smoking on Maternal Health, Am. J. Obst. & Gynec. 31:502-508 (March) 1936.
16. Sontag, L. W. and Wallace, R. F.: Effect of Cigaret Smoking during Pregnancy upon Fetal Heart Rate, Am. J. Obst. & Gynec. 29:77-83 (Jan.) 1935.
17. Grollman, A.: The Cardiac Output of Man in Health and Disease, Springfield, Illinois, Charles C. Thomas, 1932, p. 159.
18. Hatcher, R. A. and Crosby, H.: Elimination of Nicotine in Milk, J. Pharmacol. & Exper. Therap. 32:1-6 (Nov.) 1927.
19. Perlman, H. H., Dannenburg, A. M., and Sokoloff, N.: Excretion of Nicotine in Breast Milk and Urine from Cigaret Smoking: Its Effect on Lactation and Nursling. J.A.M.A. 120:1003-1009 (Nov. 28) 1942.
20. Behrend, A. and Thienes, C. H.: Development of Tolerance to Nicotine by Rats, J. Pharmacol. & Exper. Therap. 48:317-325 (July) 1933.

twenty-four hour period, and demonstrated the presence of nicotine in milk of two other patients. Chemical and biologic tests indicated no more than traces of nicotine in milk from a woman who smoked twenty to twenty-five cigarettes per day[18]. Similarly, only traces of nicotine were found in milk from a cow which had received large doses of nicotine[18].

Campbell[15] felt that it is in the nervous, high-strung, excitable individual who smokes excessively that lactation is diminished. Thompson[2] concluded that nervousness is a definite factor in suppressing lactation, regardless of nicotine intake, and that the effect of the drug is not the sole or even the chief factor involved. In this connection Johnson[21] stated, "As to its effect on the nervous system, I am inclined to think that the average highly nervous individual smokes to excess because he is nervous, rather than that he is nervous because he smokes to excess. In the average individual the effect of a smoke seems to be more soothing than stimulating."

Comment

Numerous factors must be considered in judging the clinical value of studies reviewed here. A sharp distinction must be made between acute nicotine poisoning and the chronic effects produced by habitual use of tobacco, especially cigarette smoking. The use of massive doses of nicotine in experimental animals has yielded much valuable information on nicotine poisoning. Such data have some bearing on the acute poisoning which may result from accidental or deliberate ingestion of nicotine insecticides by human beings. Under no circumstances should it be assumed that chronic effects of nicotine in the human subject are similar to acute effects of nicotine in animals. This error in reasoning has been made by several authors quoted here. To date, there have been no animal experiments which fully simulate smoking by the human being. Hence, no analogy can be drawn from the experimental data at hand.

A second defect in several papers reviewed here is the presentation of arbitrary opinions on smoking without either experimental or clinical data which support the author's views[9,15].

Little objective evidence is available as to the effect of nicotine on the physiologic processes of the human female. By far the largest part of the work reviewed is based on clinical observation, and here the variance of opinions is outstanding. In an attempt to show some correlation between the number of cigarettes consumed and toxic manifestations, the majority of the researchers have failed to consider the possibility of other factors which may influence their observations. Among these factors is the presence of products other than nicotine in tobacco, the degree of nicotine absorption[22], the variable nicotine content of different brands[3], individual sensitivity to tobacco[23], the speed of smoking[3], and the fraction of cigarette consumed.

Conclusion

Much research work of a high standard must be done on the use of tobacco by the human female before definite conclusions concerning its toxicity or lack of toxicity can be drawn. The situation has not changed since 1932, when Behrend and Thienes[5a] wrote, "A critical review of the subject of chronic poisoning by tobacco or nicotine indicates that we have a dearth of dependable data upon which judgment can be based."

21. Johnson, W. M.: Tobacco Smoking: A Clinical Study, J.A.M.A. 93:665-667 (Aug. 31) 1929.

22. Chapman, D. G.: Effects of Tobacco Smoking on Vascular System, Virginia M. Monthly 64:454-456 (Nov.) 1937.

23. (a) Herrell, W. E. and Cusick, P. L.: Effect of Inhalation of Tobacco Smoke on Vascular System, with Reference to Change in Blood Pressure, M. Clin. North America 23:1033-1040 (July) 1939.
(b) Sensitivity to Tobacco Smoke, Queries and Minor Notes, J.A.M.A. 114:913 (March 9) 1940.

EFFECTS OF THE USE OF TOBACCO ON NATURAL BLOOD SULFOCYANATES AND BLOOD PRESSURE LEVELS

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RALEIGH

In the original report of the "Correlation Between Blood Pressure and the Concentration of Sulfocyanates in the Blood"[1], based on a study of 244 unselected individuals who had never taken sulfocyanates therapeutically or experimentally, it was demonstrated that average blood sulfocyanate levels vary inversely with the blood pressure levels. Also, it was shown that each such individual

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Read before the Royster Club, Raleigh, June 16, 1948.

1. Caviness, V. S., Bell, T. A. and Satterfield, G. H.: The Correlation Between Blood Pressure and the Concentration of Sulfocyanates in the Blood, North Carolina M. J. 2: 585-592 (Nov.) 1941.

has a fixed level of blood sulfocyanate[1,2] which is constant and does not change materially from week to week. (The average weekly variation for the group was 0.14 mg. per 100 cc. of blood.) It was also reported that "we have not demonstrated any tobacco factor and are of the opinion that any tobacco influence noted in the past may have been due to the tobacco smoke present in saliva. We do not believe it could have any appreciable effect on blood sulfocyanates."[1]

Since this first report, the inverse ratio between blood sulfocyanate levels and blood pressure readings has been demonstrated repeatedly. A group in Philadelphia has attempted to prove by a study of 8 selected cases that tobacco influences natural blood sulfocyanate levels[3]. Although their figures could not justify any controversy over the subject, it appears advisable, since the question has been raised, to publish in some detail data uncovered in our original work on which the conclusions were based. The accumulated material was rather voluminous and it has been considered neither necessary nor expedient to publish all the data on which some of the less important conclusions were based. Additional information is now being offered regarding any possible correlation between the use of tobacco and natural blood sulfocyanate levels.

For various reasons satisfactory information was not secured regarding the use of tobacco in 24 cases. These failures were accidental, and since they were well scattered throughout all groups, the general picture would not be significantly altered if data were available on the additional 24 cases. It appears to be advisable to omit these cases and report only on 220 cases for whom full data are available.

In our work, as previously reported, we have arranged and used the following classification of blood pressure groups[1,2].

Below 106 systolic	hypotension
106 - 130 systolic	normal pressure
131 - 140 systolic	border line
141 and above systolic	hypertension

Diastolic pressure should be approximately two thirds of systolic pressure in the normal pressure group. No diastolic pressure above 85 is considered normal.

Much of the earlier work with sulfocyanates was done by dentists, and many of their studies were made only on saliva. In some cases, especially among smokers, the salivary sulfocyanate level was found to be higher than among some non-smokers. So far as we have been able to learn, no one has ever been able to establish any evidence that smokers maintain higher blood sulfocyanate levels than non-smokers. Apparently the impression that the use of tobacco raises sulfocyanate levels arose from a small number of determinations made on saliva. It is also probable that the higher levels in smokers resulted from the presence of smoke or particles of tobacco in the saliva. The dental investigators were searching for a cause for tooth decay, but since their studies did not yield any information of value in this field, the studies were abandoned[4].

A study of hypertensive patients being treated with sulfocyanates in Rex Hospital Cardiovascular Clinic showed that, with a few significant exceptions, there was a characteristic drop in systolic and diastolic pressures as the sulfocyanate level rose. When treatment was stopped, there was a gradual rise in the systolic and diastolic pressures, accompanied by a fall in blood sulfocyanate levels, until the levels of blood pressure and blood sulfocyanate that prevailed before treatment was begun were re-established Subsequent periods of treatment and rest from treatment gave the same results. So striking and constant were these changes that a study was undertaken to determine whether any correlation existed between natural blood sulfocyanate levels and blood pressure levels. The possibility of some correlation between the use of tobacco and natural blood sulfocyanate levels was studied at the same time with the same subjects.

It was apparent that subjects were needed for this study who would represent a good cross section of ages, blood pressure, physical health and sex, and still be kept in comparable environments. It appeared to be important that all subjects be kept under definite control with regard to physical activity, rest, diet, and the use of tobacco. These precautions were prompted by the knowledge that sulfocyanates are end products of protein metabolism.

2. Caviness, V. S., Umphlett, T. L. and Royster, C. L.: Blood Pressure and Sulfocyanates, Am. J. M. Sc. 204:688-697 (Nov.) 1942.
3. Trasoff, A. and Schneeberg, N. G.: The Naturally Occurring Blood Sulfocyanates and Their Relation to Blood Pressure, Am. J. M. Sc. 207:63-67 (Jan.) 1944.
4. (a) Pauli: Sulfocyanides, München Med. Wchnschr, No. 4, 1903.
   (b) Sollmann, T. H.: Manual of Pharmacology, Its Application to Therapeutics and Toxicology, ed. 3, Philadelphia, W. B. Saunders Co., 1926, p. 909.

Two such groups were studied. Samples of blood from all persons admitted to two state institutions were collected the second morning after admission, before breakfast and before any tobacco was used. On admission, all subjects were at rest for observation, and in both institutions the diet was ordinarily the same for each subject. Apparently we had as close a control over the environment, diet, and activities of the subjects as was possible.

At the State Prison, the diet contained an average of 145 Gm. of protein, 185 Gm. of fat, and 575 Gm. of carbohydrate, with an estimated average daily intake of about 4500 calories. This is probably within average limits for laborers. At Dix Hill (Mental Hospital) the diet contained an average of 131 Gm. of protein, 81 Gm. of fat, and 309 Gm. of carbohydrate, giving an average daily intake of 2900 calories.

The results of this study, as previously published[1], showed a range of natural blood sulfocyanate levels from 0.31 mg. to 2.55 mg., and by blood pressure groups showed an inverse ratio between the blood sulfocyanate levels and the blood pressure levels. All individuals who showed a definite elevation of blood pressure also presented a low blood sulfocyanate level. A number of subjects who had lower blood sulfocyanate levels were individuals who had been at least semi-starved. This was particularly true among new admissions to the mental hospital. The average blood sulfocyanate level for the group with normal pressures was 1.2 mg. We have previously commented on the need for a quantitative method of determining pressor substances in blood. Studies made only on depressor substances can show only one side of the picture, and as a consequence satisfactorily comprehensive analyses can not be obtained. The correlation between pressor and depressor substances is needed.

With respect to the use of tobacco, the 220 subjects for whom we had full data were distributed among all groups in both institutions. As would be expected, subjects who presented hypotension were definitely in the minority. The largest group was made up of 109 subjects with normal pressure, of whom 89 used tobacco and 20 did not. The next largest group, the hypertension group, contained 64 subjects, of whom 49 used tobacco and 15 did not. There were 30 individuals in the borderline group, of whom 22 used tobacco and 8 did not. The hypotension group contained 17 subjects, of whom 12 used tobacco and 5 did not. These figures (table 1) rather closely parallel the distribution in the population at large of blood pressure groups and of users and non-users of tobacco.

Table 1

Users and Non-Users of Tobacco by Blood Pressure Groups

	Prison			Dix Hill		
	Tobacco	*No Tobacco*	*Total*	*Tobacco*	*No Tobacco*	*Total*
Hypotension	6	2	8	6	3	9
Normal Pressure	62	14	76	27	6	33
Border Line	13	5	18	9	3	12
Hypertension	22	6	28	27	9	36

The details in this study showing the blood sulfocyanate levels have previously been published[1]. In this study it appears to be adequate to use only summaries of the voluminous figures previously published.

It is interesting to note that, of the 26 subjects who showed a blood sulfocyanate level above 1.70 mg., 25 used tobacco and only 1, with a sulfocyanate level of 1.95, was an abstainer. Of the subjects whose sulfocyanate level was below 1 mg., 70 used tobacco and 34 did not. The group with a blood sulfocyanate level below 0.75 mg. contained 49 tobacco users and 17 non-users. Among those who had a sulfocyanate level of 0.40 mg. or less, 10 used tobacco and only 1 was an abstainer. The abstainer was one of five who had the minimum level of 0.31 mg. The other four used tobacco.

It will be observed that 25 of 26 individuals who showed the higher sulfocyanate concentrations, regardless of pressure levels, used tobacco. Also, all except one in the minimum level group used tobacco. Obviously there is no pattern of any statistical significance to be found here.

Gertrude M. Cox, Head of the Department of Experimental Statistics, State College. Raleigh, gave this opinion:

"The analysis of these KSCN values for the tobacco users as compared to the non-users shows no effect of the use of tobacco on KSCN values. In fact there is more variation between the KSCN values of non-users than there is between the users as compared to non-users. In other words, there is no evidence in these data that KSCN values are related to the use of tobacco.

"Also, the study made on the number of

tobacco users in the four groups—hypotension, normal, border-line and hypertension—shows that in this sample there is no evidence of the percentage of tobacco users differing from one group to another. However, this result is somewhat obviated by the small numbers of non-tobacco users."

Conclusions

Carefully controlled studies of 220 unselected subjects who represented a satisfactory variation in age, sex, and health failed to show any significant statistical indication of any relation between blood sulfocyanate and blood pressure levels and the use or non-use of tobacco.

OBSERVATIONS ON THE USE OF VINBARBITAL SODIUM IN OBSTETRICS

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Previous reports on the use of vinbarbital sodium in obstetrics have been based on observations made in service cases. For this reason, it was felt that a study on the use of the drug in private obstetric patients would be of interest.

Methods and Material

In July, 1946, I began to use vinbarbital sodium[1] on alternate cases (group 1) in my private obstetric practice, without regard to age, parity, or stage of labor. The drug was not used on patients with heart disease nor on those with breech presentations, purely because any accidents occurring in such cases would be attributed by the patient to "experimentation with a new drug." Dosages were not standardized, but were varied according to clinical indications such as the condition and dilatation of the cervix, the interval and duration of uterine contractions, and the patient's parity and weight. The smallest total dose was 6 grains and the largest 23; the average was about 16 grains. The general procedure was to administer 6 grains orally in combination with 1/150 grain of scopolamine as soon as labor was definitely established, and to supplement this initial dose when necessary for analgesia during the first stage of labor. Ten to 12 grains were administered intravenously for anesthesia as the first stage neared completion, or even at the beginning of the second stage.

Most of the alternate cases (group 2) received Demerol in combination with scopolamine as an analgesic, and all alternate cases received ether, nitrous oxide, or both as an anesthetic.

Between July, 1946 and August, 1947, a total of 266 cases were studied. Of these, 131 or 49 per cent received vinbarbital sodium, and 135 or 51 per cent received other agents. There were 81 primiparas and 50 multiparas in the first group, 88 primiparas and 47 multiparas in the second group. Eleven patients, or 4.1 per cent, had breech deliveries. Ages varied from 17 to 44 and averaged 26 for both groups.

Results

Analgesia and amnesia

In all cases vinbarbital provided complete analgesia, and in most cases was also sufficient for anesthesia. The patients receiving it had no recollection of any procedures carried out following the intravenous administration until consciousness slowly returned ten to twelve hours later. The majority expressed disbelief when informed that their baby was already several hours old. In those few cases for which supplemental anesthesia was required, gas-oxygen-ether, or simple open ether anesthesia was added without difficulty for either mother or infant. These agents were rarely necessary except for the subcuticular portion of the episiotomy repair.

Length of labor and necessity for operative procedures

The average length of labor for the first group was nine hours and twelve minutes; for the second group, eight hours and eighteen minutes. This slight difference in so small a series was not felt to be significant. There were 90 low forceps deliveries and 83 episiotomies in the first group, 91 low forceps deliveries and 67 episiotomies in the second group. Three mid-forceps deliveries were performed in each group.

Blood loss

No facilities for accurate measurement of blood loss were available, but the total loss for each patient was estimated as being small, moderate, or excessive. In the group

From the Sternberger and St. Leo's Hospitals, Greensboro, North Carolina.

1. Made available through the courtesy of Sharp & Dohme under the trade name, Delvinal Sodium.

which received vinbarbital, 10 patients had a blood loss which was classified as moderate. In the other group, 11 lost a moderate amount of blood, and 2 an excessive quantity.

Morbidity

The incidence of morbidity in the first group was 6.1 per cent (8 patients). Two of these patients had mastitis, one a virus pneumonia beginning on the seventh postpartum day, and the other five low-grade endometritis. The morbidity for the second group was 4.4 per cent (6 cases)—1 case of mastitis and 5 cases of low-grade endometritis.

Fetal mortality

Death of the fetus occurred in 8 cases—an over-all fetal mortality of 3.0 per cent. The corrected mortality was 1.5 per cent. There were 2 deaths in the first group—one a 7 pound, 4 ounce male monstrosity with absence of the abdominal viscera, who died one hour and forty-five minutes after birth, and the other a stillborn macerated female. In the latter case fetal movements had stopped three days prior to delivery, and no fetal heart could be heard during labor.

Six deaths occurred in the alternate series. Two premature infants — both of thirty weeks gestation—died one to four hours following delivery. One full term male died during a thirty-hour labor in which delivery was effected by version and breech extraction. The fetal heart sounds were lost three hours prior to delivery, and autopsy findings were non-contributory. The fourth case was that of a stillborn 6 pound, 12 ounce male (breech presentation), in which the fetal heart was lost one hour prior to the beginning of the second stage of labor. Autopsy findings were again non-contributory. In the fifth case—another stillborn baby, whose heart sounds were lost two hours prior to the end of the first stage—the placenta showed evidences of premature separation and the autopsy showed bloody fluid in both alveoli and bronchi. The sixth baby, a 7 pound, 3 ounce male, attempted inspiration spontaneously, but expired after four and one-half hours despite attempts at resuscitation by both a pediatrician and an otolaryngologist. The only analgesia or anesthesia had been gas, oxygen, and ether for the second stage. Autopsy showed amniotic fluid in bronchi and alveoli.

Comparison of Vinbarbital Sodium with Other Analgesic Agents in 266 Private Obstetric Cases

	Group 1 *Vinbarbital Sodium*	Group 2 *Other Agents*
Total no. of cases	**131 (49%)**	**135 (51%)**
Primiparas	81	88
Multiparas	50	47
Average age	26	26
Average length of labor	9′ 12″	8′ 18″
Low forceps	90	91
Mid forceps	3	3
Episiotomy	83	67
Moderate blood loss	10	11
Excessive blood loss	—	2
Morbidity	8 (6.1%)	6 (4.4%)
Fetal mortality	2 (1.5%)	6 (4.4%)
Corrected fetal mortality	—	4 (3.0%)

In none of these fetal deaths was it felt that either analgesic or anesthetic agents were a factor.

Effect on infant

In the first group four infants required moderate resuscitation measures, and one required measures which were considered drastic. In the second group, five infants required moderate resuscitation and two required more drastic measures. It was not felt that the incidence of cases in which resuscitation was necessary was higher than the general average following any anesthetic or analgesic agent.

Complications

Restlessness during the recovery period was noted in 15 per cent of the patients in the first group. Blurred vision was noted in approximately the same percentage of cases, but was not unpleasant. Those patients who were questioned expressed a desire for the same medication with future deliveries.

The only near serious consequences of vinbarbital sodium occurred in 2 patients who, during the recovery period, attempted ambulation in a semi-conscious state. Both fell to the floor, but fortunately received no injuries, probably because of the complete relaxation occasioned by the drug.

Summary

In a series of 266 private obstetric cases, alternate patients received vinbarbital sodium. When compared with other analgesic or anesthetic agents which were administered to the remaining patients, vinbarbital was found to give more complete amnesia with a comparable safety factor from both maternal and fetal standpoints. Neither length of labor nor the incidence of operative deliveries was increased significantly by vinbarbital sodium. Morbidity and blood

loss were unaffected. The patients receiving vinbarbital sodium expressed a desire for the same medication with future deliveries.

My findings are in complete agreement with those of Dr. Lewis and his co-workers[2] regarding the safety of the drug from both maternal and fetal standpoints, the relief of pain afforded, and the absence of complications.

Conclusions

1. Vinbarbital sodium is a valuable addition to our obstetric armamentarium.
2. The drug is suitable for almost all types of patients, provided that constant observation is provided during the recovery period.
3. It offers the obstetrician an excellent agent for the safe and immediate relief of pain in cases of active, rapidly progressing labor, where the action of other drugs is frequently too slow.

2. Lewis, M. S.: Vinbarbital Sodium for Obstetric Amnesia, Analgesia, and Anesthesia, Am. J. Obst. & Gynec. 51:395-402 (March) 1946.

Maternal Welfare Section*

CESAREAN SECTION IN THE HOSPITALS OF NORTH AND SOUTH CAROLINA

Cesarean section is an operation which is widely used to solve obstetric problems. Two previous publications of the Maternal Welfare Committee have been devoted to this subject; one considered the general indications for use of the procedure and reviewed the inherent dangers to the mother and child[1]. The other reviewed Williams' series of cases[2], and suggested that similar good results could not be expected in the general use of the operation[3].

These articles came to the attention of Dr. W. S. Rankin, director of the Duke Endowment. Following is an excerpt from his letter to the Maternal Welfare Committee.

"Last year I read with sympathetic interest the statement of the Maternal Welfare Committee of the Medical Society of the State of North Carolina on 'The Intelligent Use of Cesarean Section.' Your statement suggested to me at the time that when all hospital reports for 1947 are in, we might tabulate the frequency with which the operation was used and the fatality rates following the operation in the hospitals of the two states. That we have done and I enclose herewith a copy of the tabulation [table 1]. You will note that the hospitals are identified only by numbers, not by names."

Table 1

The Duke Endowment

1947 Hospital Statistics

Incidence of Deliveries by Cesarean Section in One Hundred and Thirty-Two North and South Carolina General Hospitals, with Mortality Rates

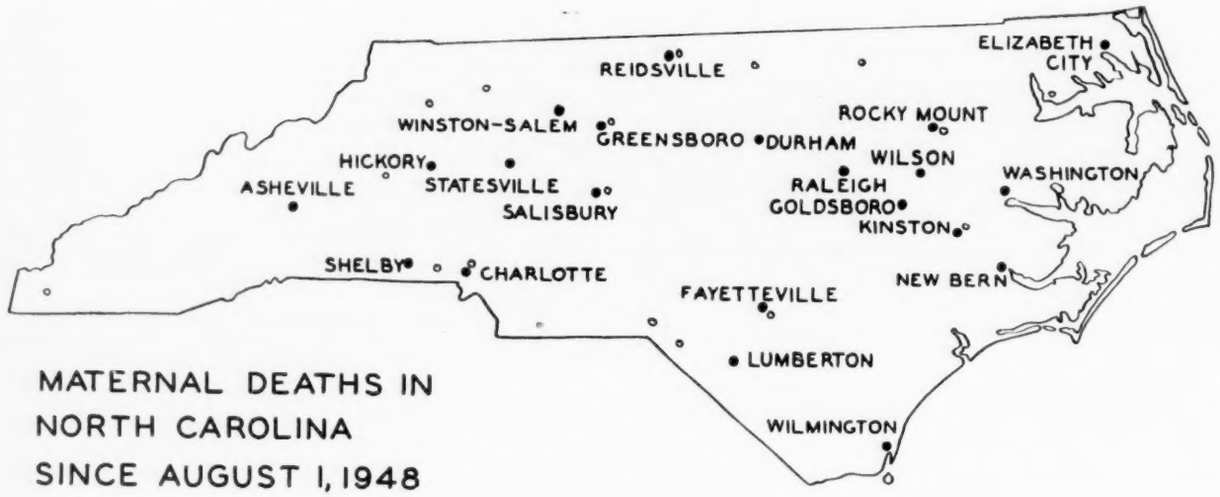
North Carolina

	Total No. Deliveries, Including Stillbirths	*Cesarean Sections*			*Incidence of Cesarean Section*
		Number	*Deaths*	*Mortality*	
1	19	7			36.8%
2	118	22	2	9.1%	18.6%
3	184	24			13.0%
4	93	11			11.8%
5	913	83	3	3.6%	9.1%
6	354	30			8.5%
7	625	51			8.2%
8	337	25			7.4%
9	165	12			7.3%
10	442	29			6.6%
11	1,657	109			6.6%
12	468	28			6.0%
13	698	42			6.0%
14	121	7			5.8%
15	356	19			5.3%
16	680	35			5.1%
17	777	40			5.1%
18	612	30	1	3.3%	4.9%
19	427	20			4.7%
20	1,177	54			4.6%
21	731	33			4.5%
22	1,233	56			4.5%
23	1,288	56	1	1.8%	4.3%
24	255	11			4.3%
25	163	7			4.3%
26	776	33			4.3%
27	168	7			4.2%
28	844	35			4.1%
29	1,685	69			4.1%
30	487	20	1	5.0%	4.1%
31	1,096	44	1	2.3%	4.0%
32	568	23			4.0%
33	503	20	1	5.0%	4.0%
34	682	26	1	3.8%	3.8%
35	566	21	1	4.8%	3.7%
36	837	31			3.7%
37	1,073	40			3.7%
38	173	6			3.5%
39	1,439	51			3.5%
40	1,206	41	2	4.9%	3.4%
41	728	25	1	4.0%	3.4%
42	560	19	2	10.5%	3.4%
43	669	23	1	4.3%	3.4%
44	749	25			3.3%
45	1,118	36			3.2%
46	717	22	1	4.5%	3.1%
47	540	17			3.1%
48	469	14			3.0%
49	766	22	1	4.5%	2.9%
50	377	11			2.9%

*Prepared by the Maternal Welfare Committee of the Medical Society of the State of North Carolina:

Frank R. Lock, M.D., Chairman — T. L. Lee, M.D.
J. Street Brewer, M.D. — G. O. Moss, M.D.
G. M. Cooper, M.D. — C. J. Powell, M.D.
E. W. Franklin, M.D. — Ivan Procter, M.D.
R. A. Ross, M.D.

1. Cesarean Section, Maternal Welfare Section, North Carolina M. J. 7:622-624 (Nov.) 1946.
2. Williams, J. T.: Cesarean Section in the Interest of the Mother, North Carolina M. J. 9:137-141 (March) 1948.
3. The Intelligent Use of Cesarean Section, Maternal Welfare Section, North Carolina M. J. 9:205-206 (April) 1948.



MATERNAL DEATHS IN NORTH CAROLINA SINCE AUGUST 1, 1948

	Total No. Deliveries, Including Stillbirths	*Cesarean Sections Number*	*Deaths*	*Mortality*	*Incidence of Cesarean Section*
51	907	25	1	4.0%	2.8%
52	2,708	72			2.7%
53	1,810	46	1	2.2%	2.5%
54	1,614	38			2.4%
55	779	17			2.2%
56	646	14			2.2%
57	243	5			2.1%
58	543	11			2.0%
59	329	6			1.8%
60	342	6			1.8%
61	670	12			1.8%
62	641	11			1.7%
63	621	10			1.6%
64	189	3			1.6%
65	1,265	19	1	5.3%	1.5%
66	494	7	1	14.3%	1.4%
67	1,471	21			1.4%
68	861	11			1.3%
69	272	3			1.1%
70	1,073	12			1.1%
71	1,983	21			1.1%
72	561	6			1.1%
73	391	4			1.0%
74	1,149	11			1.0%
75	639	6			.9%
76	482	4			.8%
77	708	5			.7%
78	1,618	12	1	8.3%	.7%
79	989	6			.6%
80	483	3			.6%
81	157	1			.6%
82	481	3			.6%
83	200	1			.5%
84	774	4			.5%
85	485	2			.4%
86	529	2			.4%
87	312	1			.3%
88	101				
89	167				
90	270				
91	0				
Total	**62,646**	**1,963**	**25**	**1.3%**	**3.1%**
		South Carolina			
1	39	7	1	14.3%	17.9%
2	926	146			15.8%
3	140	22			15.7%
4	761	72			9.5%
5	136	12			8.8%
6	704	59			8.4%
7	341	28	1	3.6%	8.2%
8	646	53			8.2%
9	326	26	1	3.8%	8.0%
10	423	32			7.6%
11	706	49	1	2.0%	6.9%
12	413	26			6.3%
13	1,113	64	1	1.6%	5.8%
14	972	55			5.7%
15	1,502	84	1	1.2%	5.6%
16	477	26			5.5%
17	222	12			5.4%
18	365	19			5.2%
19	2,286	97	1	1.0%	4.2%
20	564	22			3.9%
21	579	22			3.8%
22	638	24	2	8.3%	3.8%
23	1,510	52	1	1.9%	3.4%
24	1,407	43			3.1%
25	2,331	65			2.8%
26	295	8			2.7%
27	607	16	1	6.3%	2.6%
28	293	7			2.4%
29	176	4			2.3%
30	1,099	22	1	4.5%	2.0%
31	54	1			1.9%
32	112	2			1.8%
33	1,269	17			1.3%
34	170	2			1.2%
35	815	10			1.2%
36	614	7			1.1%
37	1,217	12			1.0%
38	561	5			.9%
39	461	3			.7%
40	716	5			.7%
41	248	1			.4%
Total	**28,234**	**1,239**	**12**	**1.0%**	**4.4%**
Total both states	**90,880**	**3,202**	**37**	**1.2%**	**3.5%**

Table 2
Causes of Death

	Number of Cases	
	Direct Cause	*Contributing Cause*
Toxemia of pregnancy	12	4
Infection	3	1
Hemorrhage	2	1
Anesthetic	4	2
Cardiac disease	4	2

In North Carolina during 1947 there were 109,372 live births, with 187 maternal deaths —a mortality of 0.17 per cent[4]. Cesarean sections were performed in 1963 cases, or 1.8 per cent of all deliveries. Three and one tenth per cent of all *hospital* deliveries in North Carolina are by the abdominal route.

The maternal death rate following this operation has vastly improved in recent years. However, 25 mothers died following cesarean section in North Carolina during 1947—a mortality of 1.3 per cent. Fifteen of the deaths occurred within twenty-four hours after the operation.

The Maternal Welfare Committee has reviewed the clinical records of the 25 mothers who died following cesarean section. There was an error in the medical management of 24 of the 25 cases. In the majority, more than one cause was responsible for the patient's death (table 2). In a cardiac patient, for example, the anesthetic and shock of the operation may be a greater factor in the patient's death than the primary heart condition.

It is clear from a study of the records that cesarean section was not the best method of delivery for 21 of the patients. An unsatisfactory consultation, or none, was obtained in these 21 cases. In 2 of the 4 cases in which a satisfactory indication was present, the operation was used in an attempt to save the child when the mother's condition was hopeless.

Although toxemia of pregnancy was the direct cause of death in 12 cases, 11 of the patients probably would have survived on standard conservative management followed by vaginal delivery. Three additional patients with hypertension died suddenly, immediately following the administration of a spinal anesthetic.

A fourth sudden death followed administration of a spinal anesthetic to a normal woman for an elective operation. Sodium pentothal anesthesia was a contributing factor in the deaths of 2 patients with cardiac disease. They probably would have lived if they had received the benefit of longer periods of conservative treatment and a vaginal delivery with local or ether-and-oxygen anesthesia.

Blood was not immediately available for the patients who died of hemorrhage. Although one of them received two transfusions, she was in poor condition for an operation. Earlier transfusion with larger quantities of blood could have saved her life.

In the final analysis by the Maternal Welfare Committee, 24 of the 25 deaths following cesarean section were considered to be preventable. The large number of successful operations recorded in table 1 is a tribute to the skill of the surgeons and obstetricians in the two Carolinas. The record can be improved by skillful administration of the proper anesthetic, by the provision and use of laboratory and blood bank facilities, and by careful selection and preparation of the patient.

4. Infant and Maternal Deaths, with Rates per 1000 Live Births, Health Bull. (N. C. State Board of Health, Raleigh) 63:16 (May) 1948.

CHAPTERS IN THE HISTORY OF THORACIC SURGERY

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X

SURGERY OF THE HEART AND PERICARDIUM

"The road to the heart is only 2 or 3 cm. in a direct line, but it has taken surgery nearly 2400 years to travel it." Sherman's words following the first successful suture of a human heart wound by Rehn in 1896 portray the struggle of the early surgeons in this field.

Like many other branches of surgery, cardiac surgery began in the field of trauma. The attention of the early physicians was directed to the heart chiefly because of wounds, which until quite recent times were regarded as being necessarily fatal. The teaching of Hippocrates that a "wound of the bladder, brain, heart, diaphragm, small intestine, stomach and liver is deadly" was accepted, and the peculiar sensitiveness of the heart was emphasized by Aristotle, Celsus, and Galen and asserted again later by such writers as Fallopius, Fabricius, Barbette and Boerhaave. These teachings were carried through the centuries, to be repeated as recently as the latter part of the nineteenth century in the words of Billroth ("The surgeon who would attempt to suture a wound of the heart would lose the respect of his colleagues") and in the thoughts of Paget ("No new method or no new discovery

can overcome the natural difficulties that attend a wound of the heart").

During these same centuries, however, there were dissenters, and it is to their continued efforts that cardiac surgery owes its advance. The sixteenth century heard Hollerius question the verity of the generally accepted belief that all cardiac wounds were fatal. Cabriolanus followed up with 2 cases of an unhealed wound and a scar respectively in the hearts of two individuals who were hanged, and maintained that death need not follow a cardiac injury. In 1642 Idonis Wolf observed a healed heart wound in a deer, and in the same year Tourby observed a cicatrix in the heart of a man who had had a sword wound four years before his death.

During the following century attention was focused on the presence of blood in the pericardial sac, and Bonetus and Morgagni observed that pressure on the heart exerted by the blood in the pericardium could cause cardiac arrest. Riolanus had long before (1650) suggested sternal trephining for aspiration of the pericardial sac, but it was not until 1828 that Larrey, Napoleon's surgeon, reported the first successful aspiration. He likewise showed experimentally that in dogs cardiac wounds were not necessarily fatal. From then until the eighteen-nineties pericardiocentesis was the principal subject of discussion and experimentation. Jowett of Nottingham showed that a trocar could be used for entering the sac, and in 1847 Kyber of St. Petersburg recorded a number of paracenteses performed during an epidemic of pericarditis associated with scurvy. During the next twenty years many new advocates of the procedure published their reports. By 1870 the method was in routine use, and a number of sites for puncture were proposed. At the same time it was gradually appreciated that paracentesis had definite dangers and did not empty the pericardium, and the argument raged regarding the respective merits of aspiration and incision.

Although the first ninety years of the nineteenth century were important from the standpoint of the development of pericardiocentesis, the stage was also being readied for the actual attack on the heart. George Fischer, in 1868, published his epoch-making compilation of 452 cases of heart injuries, including a considerable number of spontaneous recoveries. In 1871 Callender successfully removed a needle from the heart. In 1881 Roberts suggested that cardiac wounds should be treated by suture. This operation was performed on rabbits in 1882 by Block. Then, in 1895, Del Vecchio demonstrated, before the Eleventh International Medical Congress in Rome, a healed wound in the heart of a dog. The operation was performed on human patients during the following year not once, but on three occasions. Cappelen, of Christiania, in the latter part of 1895 operated on the human heart, and early in the next year (March, 1896) Farina, of Rome, also sutured a dagger wound. Both patients died, but Farina's case lived until the eighth day and the wound was shown to be healed. In September of the same year Rehn of Frankfurt finally achieved the successful suture of a heart wound, and demonstrated the result before the German Surgical Society in Berlin seven months later. Cardiac surgery had at last begun, and the masters had to bow to the few who refused to believe that it could not be done.

Suturing of the heart, then, was the turning point in the history of cardiac surgery. It terminated the long era of argument and theory over cardiac wounds, and opened the door to a new era of cardiac surgery and experimentation.

The advance of cardiac surgery since Rehn's first successful case has been truly remarkable. In 1895 Weil had proposed that the pericardium should be removed in cases of constrictive pericarditis. In 1898 Brentano, Samways and, later, Brunton, suggested that surgical intervention might be employed for valvular lesions, especially mitral stenosis. Franck, as early as 1899, proposed section of the sympathetic nerves for the relief of pain in cases of angina pectoris. In 1902 Brauer recommended the removal of part of the anterior chest wall for the relief of mediastino-pericarditis, and this was performed by Peterson. By 1907 Morison suggested and had carried out a "decompression" of the heart. The following year Trendelenburg elaborated his operation for pulmonary embolism, though without a successful result. During this time, also, the efficacy of procedures such as cardiac massage had been demonstrated; Lane's work in 1903 on this phase of surgery was outstanding.

During the first part of the twentieth century, there were several important advances in anesthesia which were to facilitate greatly the progress of cardiac surgery. Chief among these was the evolution of endotracheal in-

sufflation in 1909 by Meltzer and Auer, a technique applied later to clinical anesthesia by Elsberg. This, plus the developments in thoracic surgery during the first thirty years, made possible the rapid advancement in cardiac surgery.

The second decade of the twentieth century saw Rehn and Sauerbruch performing decortication for constrictive pericarditis in 1913. Valvular stenoses were also treated by Doyen (1913), Tuffier (1914), and Cutler (1923), with varying degrees of success. In 1916 Jonnesco began the treatment of angina pectoris by sympathectomy. In 1924 Kirschner successfully performed an embolectomy on a case of embolism of the pulmonary artery, and more recently other cases have been dealt with in a similar manner.

Since 1920, most of the outstanding work in cardiac surgery has been limited to three fields: valvular disease, coronary disease, and traumatic surgery. Progress in valvular lesions has possibly been the slowest of the three, although the efforts of Cutler, Smithy, and others foretell of miracles to come. If a method can be developed for sidetracking the blood flow during operation, progress in this field will certainly plunge ahead of all the rest.

The studies in coronary occlusion have led to three general subdivisions of surgical therapy: (1) interruption of nervous pathways, (2) introduction of extracardiac collateral vessels, and (2) ligation of the great cardiac vein. Jonnesco's work with cervical sympathectomy has already been mentioned. It was soon learned that the cervical sympathetic connections with the spinal cord are by way of the upper thoracic ganglia, and therefore Leriche proposed stellate ganglionectomy in place of cervical sympathectomy. Then in 1927 it was discovered that the cardiac plexuses are directly connected with the upper four or five thoracic sympathetic ganglia by thoracic cardiac nerves. Mandl and White showed that alcohol injection or resection of these ganglia effectively relieved anginal pain. The same results were obtained with posterior rhizotomy (Singer) and later with anterior rhizotomy (Raney). Cone modified the latter procedure even further by sectioning the posterior roots. Another form of interruption of nervous pathways has been favoured by Fauteux—namely, a pericoronary neurectomy. The plexus, including sympathetic and vagus fibers, is destroyed at the root of the aorta and pulmonary artery. All of these operations are still being performed, and time alone will determine the most efficacious method.

The earliest experimental work aimed at establishing an extraneous collateral blood supply in coronary disease was that of Beck in 1932. He made use of fibrous pericardium, pericardial fat, omentum, and skeletal muscle from the chest wall as grafts to supply new vessels. O'Shaughnessy duplicated this work independently, using omental grafts. Later Beck scarified the parietal pericardium with asbestos powder and powdered talc. Although there has been considerable criticism of the method, the long-term results in these cases of induced pericarditis are awaited with considerable interest.

An entirely different approach to the problem of improving the myocardial circulation has been developed by Fauteux. Basing his approach on Oppel's demonstration in 1913 that venous ligation in a limb is a valuable procedure in dealing with arterial disease or injury, and Gross's observation that occlusion of the coronary sinus appears to compensate in some way for later ligation of a coronary artery, Fauteux has ligated the great cardiac vein in the human patient suffering from localized coronary ischemia. As with the nerve operations, the results of this form of attack on coronary disease should prove most interesting.

Progress in the field of traumatic cardiac surgery was delayed until the second World War, although Elkin had done considerable work on the subject previously. The experiences of Harken and his associates during the last war, in connection with foreign bodies in and close to the thoracic blood vessels and heart, are particularly worthy of review, since they deal with practical aspects of intracardiac surgery. In view of Harken's reports, surgery has advanced a long way since Rehn's first cardiac suture only fifty years ago.

Although the heart has been one of the last organs in the body to be attacked surgically, progress in this field has been exceptional. When the second milestone (a method of sidetracking the blood flow during intracardiac operations) has been reached, the future of cardiac surgery will certainly be unlimited.

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THE NATION'S HEALTH

"THE NATION'S HEALTH" is an elaborate book of 186 pages which contains Mr. Oscar Ewing's report to the President on the ten-year health program.

It may be recalled that there was considerable skepticism concerning the motives of Mr. Ewing and his associates in calling the National Health Assembly last May. Many who fear federal control of the practice of medicine remembered a similar conference held in the early days of the New Deal, which furnished propaganda for the proponents of the Wagner-Murray-Dingell type of legislation. When, however, Mr. Ewing's Assembly adjourned without having recommended compulsory insurance, even so astute a student of human nature and of medical affairs as the editor of the *Journal of the American Medical Association* was lulled into stating editorially that "the subsequent developments and the final action taken have resolved the doubts and anxieties . . . While there are still knotty problems not yet unraveled . . . the nation seemed to be on the way toward the development of a plan for the production and distribution of medical services suitable to the American democracy."[1]

Unfortunately Mr. Ewing's report to the President justifies the suspicion that the Assembly was intended only as a source of propaganda for those who would force federally controlled medicine on this country. For example, in the section entitled "Voluntary or Government Insurance," Mr. Ewing says that "Many, though not all, representatives of labor and other consumer groups were strong spokesmen for a Government plan. Many, but not all, representatives of medical groups believed that voluntary insurance was the only acceptable solution."[2] Mr. Ewing, therefore, "reexamined this entire issue as objectively as possible" and is "forced to the conclusion that the voluntary insurance plans can never do the job that the national interest requires to be done."[3]

In other words, "Papa knows best."

The whole book is devoted to a rehash of the old, familiar arguments for compulsory health insurance under federal supervision. The now thoroughly discredited Selective Service figures ("5,000,000 men declared unfit physically or mentally") are taken out of mothballs. This intellectual dishonesty is in itself enough to discredit the rest of the report. It is not necessary to review all the shopworn arguments for a socialistic system of medicine, but it may be pertinent to offer a few comments on the report as a whole.

As Dr. Marjorie Shearon says,

"It is ludicrous for an out-and-out politician like Ewing to publish a report on the Nation's health. Such a report should emanate from the Surgeon General of the USPHS. This is exactly the sort of thing that former Commissioner of Education Studebaker complained of when he resigned. Here is a document politically conceived, politically engineered, and politically timed. Can one doubt it is intended to help put Ewing on the map and to publicize the

1. The National Health Assembly, Editorial, J.A.M.A. 137: 146-147 (May 8) 1948.
2. The Nation's Health: a Ten Year Program. A Report to the President by Oscar R. Ewing, Federal Security Administrator, Washington, Federal Security Agency, 1948, p. 75.
3. The Nation's Health(2), p. 88.

President's legislative program? Ewing has endeavored to make himself and his top administrative assistants spokesmen in the highly technical fields of health and medicine. Does a report on health require tinkering by professionally unqualified persons?"(4)

Particularly insidious is the danger inherent in Mr. Ewing's proposal to divert federal funds to the medical schools and hospitals of the country. Since many of our schools and hospitals are owned and maintained by various religious denominations, the acceptance of such funds would constitute a violation of the fundamental doctrine concerning the separation of church and state. Furthermore, even non-denominational medical schools and hospitals should hesitate long before giving the politicians in Washington such a golden opportunity to control their policies.

Another insidious scheme is the proposal to train 2,800 "health educators"—one "for every 50,000 population." To quote Dr. Shearon again:

"Theoretically such an educator helps people to acquire knowledge concerning health and its attainment.

"Actually, under the training program of the Public Health Service, such educators receive an unfortunate indoctrination in the philosophy of State medicine. Perhaps they are sent to Ann Arbor to be indoctrinated by Nathan Sinai. Or they may go to the University of North Carolina to hear Dr. Lucy Morgan, daughter of TVA Morgan, expatiate on the wonders of Social Security medicine . . .

"Grants for such training are now being made through the Kellogg Foundation and through the State health departments. Mayhew Derryberry, Ph.D., formerly on Perrott's staff and now on Mountin's staff, is chief of the Office of Health Education, USPHS. He works closely with Lucy Morgan. Derryberry was the prime mover in the Health Workshops exposed by the Harness Subcommittee last year. The Government could not devise a more useful scheme for developing a great army of evangelists for nationalization than by training so-called health educators. They work at the grass-roots."(4)

One final thought is that it seems somewhat presumptuous for Messrs. Ewing and Truman to propose a "ten-year program" just on the eve of a national election, after which it is quite possible that both of them will be seeking employment elsewhere.

4. American Medicine and the Political Scene, published by the Shearon Medical Legislative Service, Washington, v. 2, no. 29 (Sept. 10) 1948.

DR. JAMES KING HALL

Although Dr. James K. Hall, who died on September 10, spent most of his professional life in Virginia, he never lost his love for his native state of North Carolina. He was one of six honorary members of its State Medical Society, and seldom missed an annual session. He was on the staff of the State Hospital in Morganton from 1905 until 1911, when he and two associates founded the Westbrook Sanatorium in Richmond. He was president of this institution until his death.

In 1912 he married Miss Laura Ervin, who, with three sons, survive him. They brought his body back to be buried in the Morganton cemetery on Sunday, September 12.

During his life many honors came to Dr. Hall, unsought, as a tribute to his professional and personal ability. He was at various times president of the Richmond Academy of Medicine, vice president of the Medical Society of Virginia, chairman of the Governor's Advisory Board on Mental Hygiene, president of the National Association of Private Psychiatric Hospitals, president of the Southern Psychiatric Association, and president of the American Psychiatric Association. In 1935 his alma mater, the University of North Carolina, bestowed upon him the honorary degree of LL.D.

Many years ago Hanford Henderson wrote a remarkable essay called "The Aristocratic Spirit." Had he known Dr. Hall as an intimate friend, it would be easy to believe that in this essay Mr. Henderson was using him as his model of the true aristocrat. For example, "The aristocrat . . . must love excellence . . . disinterestedly . . . Greed, arrogance, snobbishneses, cruelty can never be the qualities of an aristocrat, for the excellence which he seeks in the great outer world, he seeks still more passionately in himself . . . He repudiates with vigor all class consciousness . . . is an uncompromising individualist, and so opposes the major currents of the hour."

No better epitaph for Dr. Hall could be found than a few sentences from a letter written by one of his most intimate friends: "He was a great man, a great friend of man, and a devoted loyal friend to those he loved, and he was a great and devoted psychiatrist. We shall all miss him very much. His remains were interred here in the town ceme-

tery and I have been up several times to speak to him, but I find his spirit is not there."

* * * *

THE POLIO PROBLEM SOLVED

The August issue of this journal contained an article on poliomyelitis by Dr. William F. Friedewald, associate professor of medicine at Emory University, and an editorial reprinting a summary of the current conception of the disease which had been prepared by Dr. Charles P. Stevick, state epidemiologist. Both these authorities admitted that there were still some gaps in our knowledge of the disease.

Thanks to the rapid progress of science, the JOURNAL is able this month to present an authoritative exposition of the etiology and treatment of poliomyelitis. In the *Twin City Sentinel* for September 4, a two-column advertisement by Dr. Floyd Strupe, chiropractor, explains the real etiology of this dread disease. By his own admission, Dr. Strupe's statement is based on exhaustive research.

"The chiropractor has proved in thousands of cases, and is daily adding to this proof, that anterior-polio-myelitis is the result in most instances, of a pinch on the anterior portion of the spinal cord or of pressure on motor nerves where they make their exit from between the joints of the spine. The pinch results from twisted spinal joints caused by falls and other accidents to which children are constantly subjected.

"The reason for the greater incidence of this disease in the Spring, Summer and Fall, is the call of the outdoors with its inducements for tree climbing, bicycle riding, wrestling, diving, leap frog, and other games through which spinal injuries originate. The low incidence of polio in the Winter is the result of youngsters being cooped up in schools and in their homes most of the time. Fear of chastisement often prevents children revealing their falls and other accidents to their parents."

How gratifying it is to have such a simple explanation for the seasonal variation of the disease! It is true that in cold weather quite a few youngsters subject their spines to considerable strain on the football gridirons and basketball courts of the nation. Wrestling is not limited to the summer months, either. It may be, however, that the thicker trousers worn in the winter serve to mitigate the fear of chastisement, so that injuries are more readily confessed to and more quickly corrected by chiropractic adjustment.

Fortunately, the cure of polio is as simple as the explanation of its cause.

"If the causative spinal injuries are corrected within a few days after polio sets in, the great majority of cases will respond immediately. And, even most chronic cases respond to such treatment very satisfactorily in due course of time."

Obviously the sensible thing for a physician to do when he is asked to treat a patient with poliomyelitis is to send for the nearest chiropractor.

* * * *

WILL C. BRAUN

On Sunday, September 12, Will C. Braun died at his home in Chicago. Although he held no medical degree, there are few physicians who have meant more to the medical profession than he did. Fifty-six of the 80 years of his life were devoted to the American Medical Association. From a modest beginning as "subscription solicitor and all-around office helper" in 1891, he became advertising manager of the JOURNAL and business manager of the American Medical Association. He had the remarkable sort of personality that made doing business with him a pleasure, and that literally endeared him to his business friends and colleagues. When he retired in 1946 to be succeeded by his first assistant, Mr. Thomas R. Gardiner, his friends and associates arranged a banquet in his honor. This occasion will be long remembered by those privileged to be present.

It has been said that institutions are often the lengthened shadows of individuals. More than one individual's shadow is represented in the American Medical Association. Along with Drs. Nathan Smith Davis and George H. Simmons the layman, Will Braun, will be remembered as long as there is an American Medical Association.

* * * *

DR. ROSS McELWEE

One of the most familiar faces at State Society meetings will be missed next year. Dr. Ross McElwee, of Statesville, died on September 8 after several months' illness. Dr. McElwee was one of the most faithful members of the State Society. For some years he represented the Society in the House of Delegates of the American Medical Association. His loyalty to his friends, his genial personality, and his high professional ideals made him one of the most highly respected members of the Society. He will be sadly missed in the years to come.

Clinicopathologic Conference

BOWMAN GRAY SCHOOL OF MEDICINE OF WAKE FOREST COLLEGE

WINSTON-SALEM

A 63-year-old man was admitted to the North Carolina Baptist Hospital on February 22, 1948, with a tentative diagnosis of a lymphomatous process.

His present illness apparently began in the fall of 1946, when he began feeling "run down." Physical examination at that time revealed some lymphadenopathy. A cervical lymph node was removed, and the pathologic report was "probably lymphoma or leukemia." There is some question as to whether or not the patient received x-ray therapy at that time. Little is known of the patient's course from then until January, 1948, when he rapidly developed ascites. The development of ascites was accompanied by dyspnea, weakness, loss of appetite, and reduced urinary output. During a period of about six weeks several abdominal paracenteses were done, and as much as 7 liters of fluid was removed at one time. No description of this fluid is available.

Examination elsewhere showed a red blood cell count of 3,400,000, and a white blood cell count of 23,000, with mononuclear cells predominating in the blood smear. There seemed to be some question as to whether these mononuclear cells were large lymphocytes or myeloblasts, and the consensus at that time was that the patient had chronic lymphatic leukemia. On the basis of this diagnosis he was given x-ray therapy, receiving a total of 1480 r. in air anteriorly over the abdomen and 400 r. in air posteriorly over the abdomen between January 14 and February 12. During the course of x-ray therapy the patient's white cell count dropped from 23,000 to 6,400, but the patient failed to show any clinical improvement.

Although the patient himself gave no history of alcoholism, we are assured that several years ago he was a very heavy drinker; it is not certain whether or not he had been drinking recently. Members of his family stated that his eating habits had been extremely poor; he ate very irregularly and sometimes would miss as many as three or four consecutive meals. The patient had one brother who died of cancer.

Physical examination upon admission to this hospital showed a few firm, shotty lymph nodes in the posterior cervical region, in both axillae, and in the right inguinal region. None of these nodes were thought to be definitely enlarged. Some ascites was present, and the abdominal wall was lax. No abdominal organs could be palpated at first, but later, following a paracentesis, the liver could be felt as an irregular mass in the right subcostal region. It extended about three fingers' breadth below the costal margin. The spleen was not felt.

Blood count showed 15 Gm. of hemoglobin, 4,950,000 red blood cells, and 5,500 white blood cells, with 75 per cent segmented polymorphonuclear cells, 2 per cent nonsegmented polymorphonuclear cells, 1 per cent eosinophils, 20 per cent lymphocytes and 2 per cent monocytes. The sedimentation rate was 10 mm. in an hour. The platelet count was normal. The mean corpuscular volume was 99 cubic microns. Urinalysis was negative, and a Kahn test was negative. Nonprotein nitrogen was 36 mg. per 100 cc., uric acid 4.2 mg. per 100 cc. Total serum proteins were 5.3 Gm. per 100 cc.—albumin 2.9, globulin 2.3. Aspiration of the bone marrow was performed, and showed the marrow to be hypercellular, with increased activity in both white cells and red cells, but with normal maturation. There was no evidence of malignant infiltration or of a leukemic process in the marrow.

Fluoroscopy and a film of the chest showed elevation of both diaphragms, most marked on the left. The heart and aorta were normal. A barium meal examination showed no intrinsic lesions of the esophagus, stomach, or duodenum; films made at five and twenty-four hours showed no pathology in the large or small bowel. A barium enema was also negative.

A galactose tolerance test showed an excretion of 1.2 Gm. and the hippuric acid test an excretion of 1.6 Gm. A bromsulfalein test showed 100 per cent retention in fifteen minutes, 70 per cent in thirty minutes, and 30 per cent in forty-five minutes. A glucose tolerance test showed a fasting level of 105 mg. per 100 cc., a rise to 203 and 200 in one and two hours respectively, and a fall to 119 and 90 in three and four hours respectively.

Biopsy of an inguinal lymph node showed only chronic lymphadenitis and no evidence of malignancy.

It was felt that the patient should be treated as a cirrhotic. He was given a diet containing 120 to 140 Gm. of protein, 250 to 400 Gm. of carbohydrate, and 100 Gm. of fat daily. Whenever the patient became unable to take the diet by mouth, it was given by means of a tube. Medication consisted of Salyrgan, 1 Gm. of methionine three times a day, and 1 cc. of crude liver extract four times a day intramuscularly. The patient did not respond to treatment, and on March 8, 1948, an abdominal paracentesis was done because of extreme distention, severe generalized abdominal pain, and respiratory distress. Six thousand cubic centimeters of amber fluid with a specific gravity of 1.006 was obtained; culture of this fluid was sterile. The total protein content of the ascitic fluid was 2.4 per cent. A few white blood cells and occasional red blood cells were present. Following the paracentesis the patient's respiratory difficulty improved considerably, but he became stuporous and unable to take food by mouth. Despite tube feeding and intravenous infusions he went progressively down hill and expired on March 11, 1948.

Discussion

DR. DAVID CAYER: This case might be discussed by an evaluation of the outstanding physical findings as they developed. These signs were generalized lymph node enlargement, noted approximately one year prior to the final hospital admission; the rapid development of ascites six or eight weeks before death; and enlargement of the liver.

Lymph node enlargement

Many of the more frequent causes of generalized lymph node enlargement can be fairly well ruled out from the information given in the clinical summary. Tuberculous lymphadenitis is unusual in a man of this age, and the absence of fever and pathology in the pulmonary or gastrointestinal tract, as well as the negative laboratory data, the lymph node biopsy, and the description of the ascitic fluid, eliminate this possibility. A diffuse gummatous syphilitic hepatitis accompanied by generalized lymphadenopathy can also be dismissed in view of the entirely negative venereal history and the negative blood serology. There is also little to justify a diagnosis of metastatic carcinoma to so many variable sites in addition to the peritoneal surfaces. There is nothing to suggest a primary site, and the areas which are the most frequent sites of primary malignancy—that is, the stomach and bowel—have been studied, with negative results.

Hodgkin's disease, although it is seen most frequently in a younger age group, is a definite possibility which could explain all the findings. In 75 per cent of the cases of Hodgkin's disease, however, splenomegaly is present; and where the abdominal nodes and liver are involved, fever is usually a prominent feature. It was not mentioned in the present case. The wasting and anemia which usually accompany Hodgkin's disease are also lacking. Furthermore, it seems unlikely that the usually characteristic pathologic picture of Hodgkin's disease would go unrecognized in the original biopsy.

The differential diagnosis on the original biopsy was apparently thought to lie between leukemia and lymphoma. Clinically, this case would not appear to be an instance of lymphatic leukemia, the clinical diagnosis of which rests on the finding of splenomegaly, anemia, and thrombocytopenia. In addition, the sternal puncture and bone marrow findings were essentially normal. I scarcely see how we could be justified in making a clinical diagnosis of leukemia.

Lymphosarcoma would be a much more likely diagnosis and would fit the clinical picture of lymph node enlargement without splenomegaly. In addition, it is not uncommon for patients with lymphosarcoma to appear to do well clinically until the terminal phase of their illness.

Ascites

Approximately one year after the discovery of lymph node enlargement, ascites developed very rapidly and recurred after each paracentesis. Although ascites, in 50 per cent of the cases, is secondary to heart disease—usually mitral disease or pericarditis —, the abscence of any associated cardiac findings or elevation of venous pressure allows us to eliminate a primary cardiac cause in this patient.

The possibility of carcinoma with peritoneal implants must again be considered. As was previously stated, however, the most frequent primary sites—the stomach, bowel, and pancreas—have been found to be negative. Generalized carcinomatosis would probably by accompanied by a rectal shelf, and no such finding is described. Ascites due to primary or metastatic carcinoma of the liver

is also relatively uncommon, and when it occurs it is usually secondary to glandular enlargement about the portal vein.

By far the most likely cause of liver enlargement and ascites in this patient would be portal cirrhosis. The abrupt onset of ascites and the rapidity of recurrence suggest the possibility of portal vein thrombosis. Acute portal vein thrombosis usually produces enlargement of the spleen, and hematemesis and melena are frequent. These findings are absent in the present case. A slower and more progressive form of thrombosis may follow stasis, and is sometimes secondary to cirrhosis.

Ascites is rare in leukemia, and would also tend to rule out this diagnosis.

Enlargement of the liver

The third finding, hepatomegaly, might be secondary to malignant change in a long-standing cirrhosis. The background of dietary inadequacy and alcoholism would certainly lead one to suspect this possibility. Primary carcinomatous change occurs in approximately 6 per cent of the cases of portal cirrhosis, but it is usually accompanied by fever, jaundice and pain, all of which are lacking in the present case. Furthermore, primary carcinoma of the liver is usually not accompanied by the laboratory evidence of parenchymatous disease found in this patient. It does not metastasize widely and would not account for the generalized lymph node enlargement noted in this patient.

It would seem, therefore, that no single diagnosis will explain all of the findings. I believe that the findings of hepatomegaly and ascites, the laboratory evidence of extensive liver involvement, and the history of inadequate diet and alcoholism would all support a diagnosis of far advanced portal cirrhosis. The abrupt development of ascites and the rapid recurrence of fluid would make one suspect portal vein thrombosis as a possible complication.

This single diagnosis, however, will not account for generalized lymph node enlargement, the tentative biopsy report of leukemia or lymphoma, the abnormal cells noted in the blood, or the leukocytosis. I believe that the most likely explanation for these findings, particularly in the absence of splenomegaly, would be lymphosarcoma. It is possible that the patient died of his cirrhosis before the other disorder developed sufficiently to produce additional anemia and cachexia. One third of the patients with cirrhosis die in coma of progressive liver cell failure.

Dr. Cayer's Diagnoses

1. Portal cirrhosis.
2. Lymphosarcoma.

Anatomic Discussion

As was expected, a large quantity (4,000 cc.) of ascitic fluid was encountered upon opening the peritoneal cavity. The liver weighed 1,350 Gm., and presented both macroscopically and microscopically the typical picture of nodular (portal) cirrhosis.

Findings in the lymphatic tissues were not so conclusive. The lymph nodes throughout the body were essentially normal, showing only minimal reticulo-endothelial hyperplasia in some instances and fibrosis in others. The spleen was only slightly enlarged (200 Gm.).

Foci of mature lymphocytes were scattered throughout the bone marrow. In this connection it is to be remembered that lymphocytes are not normally found in the bone marrow in number greater than can be accounted for by the circulating blood[1]. In the absence of other positive findings in the hematopoietic system, their presence in this case can probably be accounted for by the extensive degeneration present in the liver. Focal accumulations of lymphocytes in the bone marrow are not infrequently seen in various degenerative diseases. I do not believe that the lymphadenopathy and cellular alterations noted initially in the clinical record were a result of a primary disturbance in the hematopoietic system.

Anatomic Diagnoses

1. *Nodular cirrhosis of the liver with ascites*
2. Focal lymphocytic accumulations within the bone marrow
3. Reticulo-endothelial hyperplasia and fibrosis of the lymph nodes
4. Bronchopneumonia, bilateral
5. Pancreatic fibrosis with cyst formation and squamous metaplasia of the pancreatic ducts
6. Nodular hyperplasia of the prostate gland
7. Generalized arteriosclerosis

1. Krumbhaar, E. B. and Custer, R. P.: Note on the Differential Cell Counts of Bone Marrow, with Special Reference to Estimation of Infrequently Appearing Cell Types, Am. J. Med. Sc. 189:630-633 (May) 1935.

TUBERCULOSIS ABSTRACTS

A Review for Physicians

Issued Monthly by the National Tuberculosis Association

Vol. XXI October, 1948 No. 10

IN the war against tuberculosis the mass X-ray survey may well be considered as a reconnaissance undertaken to discover where the enemy is hidden, so that practicing physicians in the area may attack the disease most effectively. It is upon their efforts, supplemented by services within the community and reinforced by public awareness of the problem, that success or failure in the control of tuberculosis depends.

THE COMMUNITY AS A FORCE IN THE CONTROL OF TUBERCULOSIS

Modern epidemiological methods in the control of communicable disease make it imperative for workers in the field to know where, when, who, and how many any given disease attacks. The swiftest and most efficient way to the heart of this problem in the field of tuberculosis is through X-ray surveys of large population groups, preferably those which compose large metropolitan areas. These present all manner of social complexity, racial variation, and economic resources.

At the beginning of organized control movements, it was believed that the most effective means of discovering the exact nature of the tuberculosis problem in the United States was through surveys of industrial, occupational and racial groups. However, the knowledge thus secured was at best spotty and was likely to be misleading when the whole population of the country was considered. It was thereupon determined to delve into those vast reservoirs of human beings which are our great cities. Here are all the maladies that are suffered by mankind. Through a prompt discovery of the tuberculosis problem in the larger cities of our country, a reasonably exact knowledge of the extent of the problem could be realized, public action stimulated, and professional forces joined.

City-wide X-ray surveys can be conducted with relative economy of means and money. Concentration of personnel, machinery, and educational devices within densely populous communities provides, in certain respects, quicker and more valuable results than do studies conducted in sparsely settled areas. Previous experience in cities already surveyed indicates that if present facilities are fully utilized, the increased case load of tuberculosis will not present a grave problem to the community. Seventy per cent of all new cases discovered by mass X-ray survey are minimal and do not constitute a grievous public health problem. Most of these cases will be noninfectious; the disease process will be incipient; and the probability of serious progression, with adequate follow-up, will be slight. Such cases can be cared for by private physicians and public clinics, assisted by public health nurses and medical social workers. Sanatorium beds now occupied by noninfectious cases can be given over to far-advanced virulent disease which constitutes a menace to the total population.

Minimal, noninfectious cases are private physicians' cases, not sanatorium cases. The private practitioner can be a major force in the future control of tuberculosis in the communities of our country if he participates in follow-up activities after the survey has been completed. Through his efforts, minimal tuberculosis can be checked and, in individual cases, never become serious. Under the physician's care, needless distress and tragedy can be avoided. As a consequence of his vigilance, the general practitioner can reduce measurably the occurrence of deaths from tuberculosis.

Often communities can afford to enlarge present clinic and hospital facilities when they cannot afford to build new institutions. Recruiting professional personnel is always a serious problem everywhere. However, resolute efforts to procure and then train professional workers will be productive of fruitful results.

An aroused community makes for organized action. An informed community acts collectively as a social weapon against any threat to its existence. A community aware of the problem confronting it and organized for effective action is the principal force in a program to control tuberculosis. Isolated leaders and their followers, no matter how well trained or how profoundly dedicated, have little potency without the strength inherent in the human and economic resources of mobilized communities. By now it must be plain that the fight against tuberculosis is a social and economic movement as well as a disease problem. We now have enough information to be confident that an awakened awareness of the people is the chief tool for triumph.

The Community as a Force in the Control of Tuberculosis, Frances J. Weber, M. D., Editorial, **Public Health Reports, September 5, 1947.**

THE USE OF STREPTOMYCIN IN TUBERCULOSIS

A Report by the Committee on Chemotherapy and Antibiotics of the American College of Chest Physicians

September 23, 1948

The Committee on Chemotherapy and Antibiotics of the American College of Chest Physicians submits the following report of the use of streptomycin in tuberculosis.

Indications for Treatment:

Nearly all forms of tuberculosis respond to treatment with streptomycin in some degree. However, the drug should by no means be used indiscriminately.

Pulmonary Tuberculosis: It is extremely difficult to lay down hard and fast rules for the use of streptomycin in pulmonary tuberculosis. Especial care in the selection of cases is necessary. The drug has its greatest usefulness in cases with an appreciable amount of exudative disease. In some other cases streptomycin is responsible for symptomatic improvement and the prevention of complications.

1. Definitive treatment: This category includes chiefly progressive lesions of recent origin with little or no destruction of tissue, such as progressive primary tuberculosis and tuberculosis due to hematogenic and bronchiogenic dissemination.

2. Preparation for surgical procedures, including temporary and permanent collapse and excisional surgery. In some cases pneumothorax can be instituted sooner and with greater safety after a course of streptomycin. Not infrequently the drug is of great value in preparing patients as candidates for thoracoplasty. As prophylaxis, streptomycin should be used routinely in excisional procedures.

It must be emphasized again and again that streptomycin is **not** a substitute for sanatorium care and other proven procedures. Rather it is a valuable adjunct to these other measures.

Extrapulmonary tuberculosis: Streptomycin is the ony treatment available in miliary tuberculosis and

tuberculous meningitis. In such cases early and intensive treatment is imperative. Streptomycin is the treatment of choice for tuberculous sinuses, tuberculosis of the oropharynx, larynx and tracheobronchial tree, tuberculous enteritis and peritonitis, tuberculous otitis media, and tuberculous pericarditis. In renal tuberculosis, symptomatic improvement is usually prolonged and bacterial conversion occurs in some cases. Tuberculosis of the bones and joints is often improved by streptomycin but chemotherapy is not a substitute for orthopedic surgery when this is indicated.

Streptomycin is valuable as pre-operative and post-operative treatment of tuberculosis in surgery of the genito-urinary tract, surgery of bones and joints, pericardiolysis, incision and drainage of abscesses and fistulectomy.

Administration:

Streptomycin is administered by intramuscular or deep subcutaneous injection. The optimal regimen for the administration of streptomycin has not been determined. In most forms of tuberculosis results appear to be satisfactory when a dose of .5 to 1 gram a day are administered in one or two injections for six to eight weeks. With this mode of therapy complications are very infrequent and in most cases their clinical importance may be discounted. In tuberculous meningitis and miliary tuberculosis treatment should be vigorous; a dose as high as two grams per day for four months, or longer is necessary. In tuberculous meningitis results seemingly are better when intramuscular injection is supplemented by intrathecal injection of from 25 to 50 milligrams every twenty-four to forty-eight hours for two or three months, or as long as this method of administration is tolerated by the patient.

Since drug fastness is apparently closely related to duration of treatment, regardless of the daily dosage, limitation of the period to a few weeks may be effective in avoiding this phenomenon in many cases.

The physician handling a case of tuberculosis would do well to ask himself the following questions before administering streptomycin.

1. Why is streptomycin being used: for definitive therapy, as preparation for surgery, for prophylaxis, or for relief of distressing symptoms?
2. Is the type of lesion present of such a nature as to warrant the use of streptomycin in addition to other available therapy?
3. Can the purpose of chemotherapy be accomlished within the relatively short period of the drug's effectiveness? (Almost three-fourths of the patients show resistant organisms after three to four months of continuous daily streptomycin treatment.)

Other Chemical and Antibiotic Substances

There is no other substance known today which compares with streptomycin in its effectiveness against tuberculosis. The sulfones, promin and promizole, are generally ineffective alone. Experimental work is in process to determine whether or not there is synergistic action when any of these are added to streptomycin. Para-aminosalicylic acid is promising on the basis of laboratory experimentation but sufficient clinical work has not yet been done to permit evaluation of this drug. Subtilin has not had sufficient clinical trial and there is not yet enough animal experimentation to indicate its usefulness. Of the many other antibiotic substances, none has shown in preliminary experimentation indication of real value against tuberculosis and none has had clinical trial.

Submitted for the Committee on the Management and Treatment of Diseases of the Chest by the Sub-Committee on Chemotherapy and Antibiotics.

PUBLIC RELATIONS

None of us would deny that our relations with the public need to be greatly improved. This problem can be approached in two ways:

1. Much can be accomplished by medical organizations at the various levels: national, state, district, and county.
2. It is the doctor as an individual who can accomplish more than all medical organizations combined.

Certainly any citizen is more influenced by his physician, in whom he has confidence, than by a publicity release from a medical society. The average busy doctor, seeing 25 to 50 patients daily, has just this many opportunities to influence public opinion where public opinion first originates, with the individual. He has the unparalleled opportunity to influence public opinion favorably, not only by words, but by efficient, sympathetic service and at a reasonable cost.

But whether it be the medical society or the individual physician who is the emissary of good will, there need be no necessity for assuming an attitude of defense. The history of the medical profession and the achievements of American medicine provide a firm foundation for offense.

Let it be known, as was shown in a recent study of the Brookings Institute, made at the request of Senator H. Alexander Smith, Chairman of the Sub-Committee on Health, that "the United States under its voluntary system of medical care has made greater progress in the application of medical and sanitary science than any other country. This progress is now reflected in low mortality and morbidity rates of infectious diseases and in increased life expectancy. There is every reason to believe that these trends will continue unabated under our present system of medical care." And, too, "The advances in health among both the whites and the non-whites that have been made in the United States in the past four decades do not suggest basic defects in the American system."

And to those who would favor compulsory health insurance let it be known that "the large majority of American families have the resources to pay for adequate medical care if they elect to give it a high priority among the several objects of expenditure. The issue is not whether they can afford

medical care but whether they should be compelled by law to pool their risks and to give payment for medical care a top priority." It is true that "the United States has some individuals and families not possessed of the resources to enable them to pay for adequate medical care. . . . It is doubted if they could be effectively covered by compulsory insurance because they would lack the means to attain and maintain an insured status." In the past, provision has been made for these people chiefly by private philanthropy. Our present system of taxation makes a continuation of this impossible. In the future, provision must be made for them chiefly through public funds. And finally, "It must be remembered that good health is not exclusively a matter of medical care; it also impinges upon causative factors that are nonmedical, such as food, shelter, vice and crime, transportation, and industry. Its maintenance depends also upon the intelligence, interest and cooperation of the individuals, families, and local communities."

Our committee on public relations is doing excellent work. It has accomplished much and it will accomplish more; but let us remember that in final analysis any real and lasting improvement in our relations with the public will rest primarily upon the individual doctor, who must do his utmost to practice honest, efficient, sympathetic medicine and at a reasonable cost to the patient.

DONNELL B. COBB, M.D.
Goldsboro

CORRESPONDENCE

914 Johnston Building
Charlotte 2, North Carolina
September 17, 1948

To the Editor:

You will recall that the Federal Bureau of Investigation has for some time been seeking the apprehension of one Hugo Bob Hubsch, and in this regard you were contacted in view of his physical condition with the purpose in mind of publishing his description.

I wish to advise you that Hubsch has been apprehended and again express to you my appreciation for your cooperation in this matter.

Very truly yours,
Charles W. Brown
Special Agent in Charge

BULLETIN BOARD

NEWS NOTES FROM UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

Postgraduate medical courses sponsored by the University School of Medicine and the Extension Division have been arranged at Shelby beginning September 30 and at Salisbury beginning October 6, with the Medical Societies of Cleveland and Rowan Counties as co-sponsors of the program at each. The program for the two courses is as follows:

Shelby

September 30: After-Care and Social Rehabilitation in Poliomyelitis—Dr. Morton Hoberman, New York City (Co-sponsor, National Foundation for Infantile Paralysis)

October 14: Recent Advances in Hematology; The Treatment of Leukemia with New Chemotherapeutic Agents—Dr. Roy R. Kracke, University of Alabama Medical College, Birmingham.

October 28: Diagnosis and Treatment of Diseases of the Colon—Dr. John deJ. Pemberton, The Mayo Clinic, Rochester.

November 11: Office Gynecology; Management of Important Obstetrical Problems — Dr. Edward A. Schumann, Philadelphia.

November 18: Common Metabolic Disorders in General Practice, Including Diabetes and Obesity—Dr. Elmer L. Sevringhaus, Nutley, N. J.

December 2: Neurosurgical Problems in General Practice—Diagnosis and Treatment — Dr. Barnes Woodhall, Duke University School of Medicine, Durham.

December 9: Management of Cardiovascular and Renal Diseases in General Practice—Dr. J. Edwin Wood, University of Virginia School of Medicine, Charlottesville.

Salisbury

October 6: The Treatment of Arthritis—Dr. Russell L. Cecil, Cornell Medical School, New York City.

October 13: Problems in Anemia and Other Diseases of the Blood—Dr. William P. Murphy, Harvard Medical School, Boston.

October 20: Basic Principles in the Administration of Food and Fluid to Infants. Psychogenic Factors in Anorexia and Other Problems—Dr. A. A. Weech, University of Cincinnati School of Medicine, Cincinnati.

October 27: Diagnosis and Treatment of Diseases of the Colon—Dr. John deJ. Pemberton, The Mayo Clinic, Rochester.

November 3: Functional Menstrual Disorders—Dr. Arthur V. Greeley, Cornell Medical School, New York City.

November 10: Problems in Obstetrics—Dr. Edward A. Schumann, Philadelphia.

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Dr. C. T. Kaylor, of the Department of Anatomy, and Dr. H. D. Bruner, of the Department of Pharmacology, attended the program on radioactive isotopes of the Cold Springs Harbor Symposium on Quantitative Biology and a series of lectures at the Brookhaven National Laboratory, Upton, Long Island, on nuclear physics fundamental to research in the application of radioactive substances to research in biological problems.

Dr. H. D. Bruner, of the Department of Pharmacology, and Dr. G. C. Kyker, of the Department of Biological Chemistry, were in Oak Ridge, Tennessee, for the four weeks' course in the techniques of using radioisotopes in research, which course was a part of the fellowship program developed by the division of biology and medicine of the Atomic Energy Commission.

Dr. K. M. Brinkhous, of the Department of Pathology, has been appointed to the Board of Editors of the **Journal of Laboratory and Clinical Medicine.**

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Dr. Ione Rhymer has joined the staff of the Department of Bacteriology as acting assistant professor. She received her Ph.D. degree from the University of Illinois, and recently has been doing research work at that institution.

* * * *

Dr. Margaret C. Swanton, instructor in pathology, is at the Royal Victoria Hospital in Montreal for a month's study in the methods used in cytological diagnosis of cancer; following the conclusion of this study she will visit the laboratory of Dr. George Papanicolaou, of Cornell Medical School, reviewing methods in use in his laboratory.

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Research grants for the present year have been made as follows:

Department of Pathology—$13,716 for study of hemorrhagic diseases and $5,000 for cancer teaching from the U. S. Public Health Service.

Department of Biological Chemistry—$1500 to Sanford Steelman from the U. S. Public Health Service for the investigation of hydrolysis of proteins by means of aliphatic sulfonic acids; $700 from the Alamance General Hospital for the investigation of the oxalic acid content of state and regional vegetables and fruits and its relation to calculus formation.

Department of Pharmacology—$5,000 to Dr. H. D. Bruner from the Atomic Energy Commission for the study of blood flow in liver and kidney.

Department of Physiology—$10,488 to Dr. John H. Ferguson from the U. S. Public Health Service for study of blood coagulation; $14,000 to Dr. A. T. Miller from the University Physical Education Department for studies on fatigue; $2500 to Dr. E. P. Hiatt from Cinchona Products to continue studies on the effects of cinchona alkaloids on the heart and blood vessels of mammals.

News Notes from the Bowman Gray School of Medicine of Wake Forest College

A chapter of Alpha Omega Alpha, honor medical society, will be installed at the Bowman Gray School of Medicine on Friday evening, November 19. Bowman Gray was one of four medical schools in the country whose applications for chapters were approved this year.

* * * *

Dr. James A. Harrill was elected president of the North Carolina Eye, Ear, Nose and Throat Society at a joint meeting of the North Carolina Society and the South Carolina Society of Ophthalmology and Otolaryngology, held in Charleston, South Carolina, September 13-16. He also spoke on the subject of "Bronchography" at one of the sessions.

* * * *

A grant of $3,500 from the Roche Anniversary Foundation of Montclair, New Jersey, has been made to the Department of Physiology and Pharmacology of the Bowman Gray School of Medicine. The grant, which provides for study of two types of drugs—vasodilator and vasoconstrictor—will be administered by Dr. Harold D. Green, head of the department. The school received a similar grant from the Foundation last year.

Dr. Harold D. Green served as associate editor for the section on "Circulation—Blood Flow Measurement" in a new book, **Methods in Medical Research,** which is just off the press of the Year Book Publishers. The book is the first in a series of volumes to be published on the subject under the direction of Dr. Van R. Potter, of the staff of the Medical School of the University of Wisconsin.

* * * *

Dr. George T. Harrell, Jr., professor of internal medicine, and Dr. David Cayer, assistant professor of internal medicine, delivered papers at the meeting of the Southern Medical Association, held in Miami, Florida, October 25-28. Dr. Harrell's subject was "Aureomycin—A New and Orally Effective Antibiotic," and Dr. Cayer's subject was "The Use of Radioactive Phosphorus in Measuring Phospholipide Formation in Patients with Liver Disease." Dr. W. E. Cornatzer, assistant professor in the Department of Biochemistry, collaborated on the latter paper, and Dr. Manson Meads, instructor in internal medicine, collaborated on the paper on aureomycin.

Matheson Foundation Medical Lectures

Charlotte, North Carolina

PROGRAM

Ballroom, Hotel Charlotte—October 21 and 22, 1948

Thursday, October 21

2 p.m. Symposium on Congenital Heart Disease

1. Dr. Arthur M. Master, Mt. Sinai Hospital, New York City—Clinical Aspects of Congenital Heart Disease.
2. Dr. Eugene Pendergrass, University of Pennsylvania, Philadelphia — Roentgenological Findings in Congenital Heart Disease.
3. Dr. Julian Johnson, University of Pennsylvania, Philadelphia—The Surgical Aspects of Congenital Heart Disease.

6 p.m. Private Dinners.

8 p.m. 1. Dr. George Gammon, University of Pennsylvania, Philadelphia — Clinical and Serological Results in the Treatment of Neurosyphilis with Penicillin Alone.

2. Dr. Robert A. Kimbrough, Jr., University of Pennsylvania, Philadephia — Rational Uses of Estrogens.
3. Dr. Eugene Pendergrass, University of Pennsylvania, Philadelphia—Roentgen Diagnosis of Meningiomas.

Friday, October 22

2 p.m. 1. Clinicopathologic Conference
Dr. Balduin Lucke, University of Pennsylvania, Philadelphia
Dr. Kendall A. Elsom, University of Pennsylvania, Philadelphia

2. Dr. Byron E. Hall, Mayo Clinic, Rochester, Minnesota—Current Trends in the Treatment of Diseases of the Blood and Blood-forming Organs.

6 p.m. Social Hour—Rose Room, Hotel Charlotte

7 p.m. Dinner—Ballroom, Hotel Charlotte

8 p.m. 1. Dr. J. Burns Amberson, Columbia University, New York City—The Behavior of Tuberculosis under Streptomycin Treatment.

2. Dr. Harry Gold, Cornell University, New York City — Management of the Failing Heart.

News Notes from the State Board of Health

Vital statistics for the first half of 1948 now have been compiled by the North Carolina State Board of Health, together with comparative figures for the corresponding period of 1947.

From January 1 through June 30, 54,842 live births were reported, as compared with 57,176 for the same months last year—a decrease of 2,334. It was not expected that the high rate maintained through last year would continue indefinitely.

As to the number of deaths from all causes, 15,781 were reported the first half of this year, an increase of only 389 over last year. This increase was more than accounted for by that reflected in deaths from just four degenerative diseases—namely, heart disease, apoplexy, cancer and nephritis which killed 8,818, as compared with 8,197 during the first half of 1947.

While deaths from nephritis seem to be stationary, or on the decline (slightly) for the time being, this cannot be said of heart disease, apoplexy and cancer. For example, during the first six months of 1947, there were 3,778 deaths in North Carolina due to heart disease; the total for the corresponding period of the present year rose to 4,287. This was a substantial increase. Apoplexy deaths rose from 1,736 to 1,822, and cancer deaths from 1,292 to 1,395. All such deaths have been increasing steadily during recent years, these diseases having shoved tuberculosis, typhoid fever and several others into the background.

* * * *

Basing his remarks on figures furnished by the office of Colonel L. C. Rosser of State Department of Motor Vehicles, Dr. Roy Norton, State Health Officer, has made the following statement concerning traffic accidents involving children in North Carolina.

"During the entire year of 1947, 96 children under 15 years of age died as the result of traffic accidents. Of this number, 68 were pedestrians struck by vehicles; 16 were bicyclists, and the remainder were passengers in wrecked cars."

"In addition to the 96 children who were killed, 621 children under 15 were injured, many of them severely, quite a number maimed for life. Of the total number injured, 265 were pedestrians, 63 were bicyclists and the others passengers in the cars involved in the accidents."

". . . For the first six months of 1948—the current year—there were 308 traffic deaths reported by the State Department of Motor Vehicles. Of this number, the compilation shows, 45 were children under 15 years of age. Thirty of these were pedestrians, six were bicyclists, and the others were passengers in the vehicles involved."

"Compare these figures with deaths in North Carolina resulting from diseases associated with early childhood, for the periods under consideration. During the entire year of 1947, when 96 children under 15 died as the result of motor vehicle accidents, only 33 died of diphtheria, 26 of measles, two of scarlet fever, 53 of whooping cough, and 21 of poliomyelitis."

News Notes from the North Carolina Tuberculosis Association

An Institute for Tuberculosis Workers was conducted by the National Tuberculosis Association in cooperation with Johnson C. Smith University at Charlotte, October 5 to 12. The Institute was planned primarily for Negro lay workers in the tuberculosis movement. Among those taking part in the program was Dr. P. A. Yoder, superintendent and medical director of the Forsyth County Tuberculosis Sanatorium.

Ninth District Medical Society

The Ninth District Medical Society held its annual meeting in Statesville on September 30. Doctors taking part in the afternoon program were Dr. C. W. Armstrong of Salisbury, Dr. J. L. Pressly of Statesville, Dr. J. A. Valone of Lexington, Drs. W. H. Patton and John C. Reece of Morganton, Dr. J. W. R. Norton of Raleigh, and Dr. S. F. Ravenel of Greensboro. Dr. James W. Davis of Statesville was toastmaster for the dinner meeting, at which Dr. Roscoe D. McMillan of Red Springs and Dr. Norman Q. Brill of Washington, D. C., were guest speakers.

The next meeting of the Society will be held in Lenoir on the last Thursday in September, 1949. Dr. Roy Tatum of Taylorsville was elected president for the coming year, Dr. C. R. Hedrick of Lenoir, president-elect, and Dr. Charles M. Kendrick secretary. Dr. W. D. McLelland of Mooresville was the retiring president, and Dr. I. E. Shafer of Salisbury is district councilor.

Edgecombe-Nash Counties Medical Society

Speakers at the September meeting of the Edgecombe-Nash Counties Medical Society, held in Rocky Mount on September 15, were Dr. J. W. R. Norton of Raleigh, State Health Officer, and Dr. Julian Brantley, Jr., of Rocky Mount, who spoke on "Toxic Separation of Placenta with Anuria."

Forsyth County Medical Society

A dinner meeting of the Forsyth County Medical Society was held in Winston-Salem on September 14 for a discussion of the Red Cross Blood Bank program.

News Notes

Dr. Hassell Brantley of Spring Hope, the oldest member of the Edgecombe-Nash Counties Society, died recently. His son, Dr. Julian Brantley of Spring Hope, and his grandson, Dr. Julian Brantley, Jr., of Rocky Mount are both members of that society.

* * * *

Dr. DeWitt D. Phillips, Jr., has become associated with Dr. Frank Ray of Charlotte in the general practice of medicine.

Grant for Research

Smith, Kline & French Laboratories of Philadelphia, manufacturers of ethical pharmaceuticals, announces the award of a grant in aid of medical research to the Duke University Medical School for research by Dr. Frank Melton, under the direction of Dr. J. L. Callaway, on the metabolism of fungi ($2,500).

Nashville Post Graduate Medical Assembly

The Nashville Post Graduate Medical Assembly, sponsored by the Nashville Academy of Medicine, was held in Nashville, Tennessee, October 6 and 7. Among those appearing on the program were Drs. E. C. Hamblen and Julian M. Ruffin of the Duke University School of Medicine, Durham.

(BULLETIN BOARD CONTINUED ON PAGE 546)

AUXILIARY

LETTER FROM THE FIRST VICE PRESIDENT

Dear Auxiliary Members:

According to the roster of members of the State Medical Society, there are ninety-six counties organized into eighty-one different societies. The Auxiliary to the Medical Society has organized into twenty-eight groups made up of thirty-four counties. The lines of organization of the Auxiliary must follow those of the county medical society.

For a local group to organize, it is necessary to secure the permission of the medical society of that county. The councilor of each district will assist in arranging the organizational meeting.

Sometimes it has seemed advisable to organize on a district level before having a county organization. This has been an easy pattern to follow, since the auxiliary meeting is called at the same time of the district medical society meeting.

In communities where there is no organization the wives of doctors are invited to be members-at-large.

The Auxiliary is looking forward to a year of expansion. We are also looking forward to a year of growth in fellowship and understanding because we know each other better and because we comprehend more of the problems of the medical profession as well as something of the problems of the people of North Carolina who are served by the profession.

The following District Councilors will welcome inquiries from groups ready to organize:

First District (Bertie, Chowan-Perquimans, Gates, Hertford, and Pasquotank-Camden-Dare-Currituck)—Mrs. J. E. Smith, Windsor.

Second District (Beaufort, Carteret, Craven, Hyde, Jones, Lenoir, Martin-Washington-Tyrrell, Pamlico, Pitt) — Mrs. Ben Royal, Morehead City.

Third District (Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender, and Sampson)—Mrs. E. C. Anderson, Wilmington.

Fourth District (Edgecombe, Nash, Greene, Halifax, Johnston, Northampton, Wayne, Wilson and Warren)—Mrs. J. W. Rose, Pikeville.

Fifth District (Chatham, Cumberland, Harnett, Hoke, Lee, Moore, Richmond, Robeson and Scotland)—Mrs. Stuart Willis, McCain.

Sixth District (Alamance-Caswell, Durham-Orange, Franklin, Granville, Person, Vance, Wake)—Mrs. W. T. Ward, Raleigh.

Seventh District (Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Montgomery, Rutherford, Stanley, and Union)—Mrs. Charles Nance, Charlotte.

Eighth District (Forsyth-Stokes, Guilford, Randolph, Rockingham, Surry-Yadkin, Wilkes-Alleghany) — Mrs. C. V. Tyner, Leaksville.

Ninth District (Avery, Burke, Caldwell, Catawba, Davidson, Iredell-Alexander, Rowan-Davie, and Watauga-Ashe)—Mrs. J. S. Holbrook, Statesville.

Tenth District (Buncombe, Cherokee, Haywood, Henderson, Jackson, McDowell, Macon-Clay, Madison, Mitchell-Yancey, Swain-Graham, and Transylvania) — Mrs. Charles D. Thomas, Black Mountain.

Let's start working early in the year to insure an effective job for the Auxiliary.

Sincerely yours,
MRS. W. REECE BERRYHILL
First Vice President and
Chairman of Organization

RECIPE FOR HUMAN WELFARE

Human beings require balanced diets for health and well-being. A community, likewise, cannot get along with nothing but recreational facilities . . . or health services only . . . or care for children alone. Like the individual man, woman or child, the community —which includes many men, women and children—needs a balanced ration of health and welfare. The Community Chest, combining many Red Feather services for health, recreation, child care and family aid, presents this balanced ration. Make your Community Chest pledge now . . . and GIVE ENOUGH FOR ALL THE RED FEATHER SERVICES.

BOOK REVIEWS

Textbook of Endocrinology. By Hans Selye, M.D., Ph.D., Prague, D.Sc. McGill, F.R.S. Canada, Professor and Director of the Institute of Medicine at Chirurgie Experimentales, University of Montreal. Preface by Professor Bernardo A. Houssay. 914 pages. Price, $10.24. Montreal, Canada: Acta Endocrinologica, University of Montreal, 1947.

Dr. Selye has accomplished a correlation of the data pertaining to the specialized field of endocrinology in one complete volume. In preparing his **Encyclopedia of Endocrinology** he compiled a library of more than 250,000 entries upon the field of endocrinology. In the present **Textbook of Endocrinology** he has brought together in the form of a concise and balanced summary the most important and best established facts concerning all branches of the science of internal secretions.

The organization of the book is excellent. A major section is devoted to each of the glands of internal secretion and the abnormalities associated with deviations from normal function. A section on general endocrinology, including the definition and scope of endocrinology, mechanism of hormone action, and correlations, is present. A full index and an elaborate table of contents, with subheadings referring to specific endocrine problems, facilitate location of the subject matter.

Numerous photographs and concise charts and diagrams illustrate this text. An excellent picture of the clinical appearance of each endocrine abnormality is included.

Dr. Selye's interesting style and his ability to organize his material, together with the large, clear print and good quality paper, make this text very easy to read.

The reviewer considers this the best book on general endocrinology which has appeared recently. It is highly recommended for medical students, general practitioners, and specialists.

Advances in Military Medicine. Edited by E. C. Andrus and others. 900 pages. Price, $12.50. Boston: Little, Brown, and Company, 1948.

This two-volume work was edited by a distinguished group of American scientists. The title somewhat conceals the true nature of the contents. It is true that most of the advances described in the books were of particular military importance. However, the description of progress in military medicine during the early nineteen-forties was the story of the progress of medical science in general. This work gives a good idea of the terrific problems which faced medical science during the war. The solution of those problems made by the unprecedented effort of American and other allied scientists, backed by unlimited physical and financial resources, is described in some detail.

The book is really a chronicle of the work of the Committee on Medical Research of the Office of Scientific Research and Development. As such, it should be on the shelves of every medical library where reference work will be done. It is also recommended for private libraries where the reader may be interested in an over-all perspective of medical progress during the war years. Although much valuable information is contained in the two volumes, the work can not be recommended generally for a ready reference book or for a book of universal medical appeal.

Advances in Pediatrics, Volume 3. Edited by S. Z. Levine, M.D., Allan M. Butler, M.D., L. Emmett Holt, Jr., M.D., and A. Ashley Weech, M.D. Eight contributors. 363 pages. Price, $7.50. New York: Interscience Publishers, Inc., 1948.

The third volume of **Advances in Pediatrics** again presents a series of monographs on subjects of pediatric interest. In general, the choice of articles and authors is excellent. Five of the eight articles were of particular interest to this reviewer.

Clement A. Smith discusses the problems of the newborn infant clearly. The etiology and treatment of disease in the newborn are presented so clearly that this chapter is almost obligatory reading for the general practitioner, obstetrician, and pediatrician.

William G. Lennox outlines authoritatively the present approach to the treatment of epilepsy. The logical presentation makes this an extremely easy article to read. Those physicians who are discouraged in the treatment of epilepsy will find this a most valuable paper.

Joseph Stokes, Jr., brings the status of viral hepatitis up to date. Because of the apparent increase in this syndrome, this discussion should be of considerable interest.

Sexual development during childhood and adolescence is a much misunderstood problem. Lawson Wilkins discusses the question in a scholarly manner, giving particular attention to normal variations.

"The Osteochondroses" by Beckett Howorth brings to the attention of the physician the probability that this disease is not diagnosed as frequently as it should be. The therapeutic procedures are outlined. These would be of particular interest to the orthopedist.

Well presented, but of less widespread interest, are the sections on "Retrolental Fibroplasia," "Emotions and Symptoms in Pediatric Practice," and "Psychologic Considerations of Puberty and Adolescence."

The references alone are worth while. This volume should be read by all who are interested in anything more than the superficial approach to the subjects presented. It is difficult to say whether the student, practitioner, or specialist would find this book more useful. It is hoped that the publishers will continue to put out similar volumes periodically.

An Introduction to Physical Methods of Treatment in Psychiatry. By W. W. Sargant and E. T. O. Slater, ed. 2. 215 pages. Price, $3.50. Baltimore: Williams & Wilkins Company, 1948.

The second edition of this volume brings up to date the methods of physical therapy, that branch of treatment which has borne such important fruit in the specialty of psychiatry. The main plan of the second edition is similar to that of the first. This book answers many of the important questions concerning the treatment of the mentally ill patient. Technique is described in detail, and the risks, complications, contraindications, and other pertinent factors are presented in clear, concise, and usable form. There is an excellent section on prefrontal lobotomy, and a very fair estimate of the expected results is set forth.

This book is recommended for several medical groups. It is an excellent handbook for those beginning psychiatric therapy. It is recommended for the medical student, and also for practitioners in any branch of medicine who wish to know of the treatment carried out in psychiatric institutions, and what might be accomplished by modern therapy of the nervous and mental disorders.

Medical Writing, The Technic and the Art. By Morris Fishbein, M.D., Editor, **The Journal of the American Medical Association,** with the assistance of Jewel F. Whelan, Assistant to the Editor. Ed. 2. 292 pages. Price, $4.00. Philadelphia: The Blakiston Company, 1948.

The second edition of Fishbein's **Medical Writing** is 80 pages longer than the first, and is improved in many ways—format, typography, and organization. A chapter on "Indexing" has been added, and the chapters on "Illustrations," "Preparation of the Manuscript," and "Proofreading" have been revised and expanded. Among the new material included are a table of eponymic diseases, a section on abbreviations in ophthalmology, a section on trade-marked drugs, and a paragraph on reprints (which is inserted, oddly enough, in the chapter on "Tables and Charts").

One apparent contradiction has resulted from the insertion of new material: On page 45 it is now stated that "Another expression to be eradicated is 'biopsy showed' or 'revealed.' It is of course the histopathologic examination and not the operation of performing a biopsy which showed what was present." According to page 53, however, "Biopsy is an examination of tissue; it is therefore not correct to speak of 'taking a biopsy.'"

This book, of course, presents chiefly the editorial policies of the publications of the American Medical Association, which are not accepted by all medical writers and editors. Nevertheless, Dr. Fishbein, as editor of the **Journal of the American Medical Association,** is in a position to speak with authority on the subject of medical writing. Certainly any writer who follows faithfully the suggestions given in his book need never be ashamed to send his manuscripts to any medical publication in the country.

This book, if not required reading for all physicians, should certainly be used as a guide by all who contribute—or aspire to contribute—to medical literature.

History of the Medical Society of the District of Columbia. Part II, 1833-1944. By the History Committee: John Benjamin Nichols, chairman; William Johnston Mallory, Joseph Stiles Wall. 357 pages. Fourteen illustrations. Baltimore: Waverly Press, 1947.

This publication constitutes the second volume of a comprehensive history of the Medical Society of the District of Columbia, founded in 1817. The first volume was published in 1909, "a valuable historical contribution, a rich mine of information relating to the activities" of the original society. The present volume contains the story of a merger with another independent organization, the Medical Association of the District of Columbia, founded in 1833. These two were joined together in 1911, forming one body, taking over "the functions, activities and powers of both the preceding organizations in equal and coordinate measure."

The book, as a historical report, is worthy of interest to those who would need it for reference, and as an addition to the general history of medicine in the United States. It is replete with indexes and cross-references, compiled with accurate and helpful citations. Over one half of the pages are devoted to names, dates, by-laws, and minutes of meetings. It represents an immense amount of toil by one or more whose personal devotion to the cause was strong and sincere.

Clinical Diagnosis by Laboratory Methods. —A Working Manual of Clinical Pathology. By James Campbell Todd, Ph.B., M.D., Late Professor of Clinical Pathology, University of Colorado School of Medicine; Arthur Hawley Sanford, A.M., M.D., Professor of Clinical Pathology, Mayo Foundation, University of Minnesota; Senior Consultant, Division of Clinical Laboratories, The Mayo Clinic; with the Collaboration of George Giles Stilwell, A.B., M.D., Division of Clinical Laboratories, The Mayo Clinic. Ed. 11. 954 pages, with 397 figures. Price, $7.50. Philadelphia and London: W. B. Saunders Company, 1948.

The field of clinical pathology is becoming extremely complex, and any book dealing with all the tests of clinical chemistry, bacteriology, hematology, and parasitology and their interpretations would be ponderous and impractical for ordinary use. The eleventh edition of this well known work contains a large amount of pertinent information for the medical student, the technician, and the clinician. The organization is unchanged and is logical. In this volume additions have been made in material and illustrations which are concise and practical.

There are several features of this book, however, which contradict the subtitle, "A Working Manual of Clinical Pathology." For a "working manual," too much extraneous material is included, particularly in the chapter on sputum examination; one obtains the impression that this section has not been sifted and abstracted to the extent demanded by present-day concepts. The chapter on urinalysis is marred by the fact that the older tests are described with rather frequent disregard for the directions of the original author, and without a reference to the original publication. The section on Watson and Schwartz's test for porphobilinogen (p. 103) states that zinc acetate is used, whereas the directions given in the original article call for sodium acetate. Another example is the Ehrlich test for urobilinogen (p. 98, no reference), in which the statement is made that "normal amounts of urobilinogen will cause the red color only when the urine is heated." This statement has never been seen by the reviewer in any other set of directions for performance of this test. To students and technicians who use such a manual for setting up routines in the laboratory, the lack of proper references or statements giving the reason for modification of a test is a disadvantage. To teachers of students and technicians, the inclusion of such statements necessitates further annotations and correction of the text. Finally, the failure to include errors of some tests, and causes of false-positive tests gives the laboratory technician who does not have a background in medicine an unwarranted sense of security.

Despite the objections which limit this manual as a complete reference, the book is well written in relatively simple language, and is one of the more valuable texts in clinical pathology.

Classified Advertisement

WANTED—YOUNG PHYSICIAN for large North Carolina industry; class A medical school graduate; Southerner preferred. Good salary plus security benefits; regular hours. Give full particulars of self in reply. Address Box 2871, Winston-Salem, N. C.

BULLETIN BOARD

(CONTINUED FROM PAGE 542)

CORRECTIONS FOR THE DIRECTORY

The names of two members of the Committee to cooperate with the U.N.C. authorities with reference to the selection of the Medical School Faculty were inadvertently omitted from the list of committees which was published in the supplement to the August issue. Dr. Louis G. Beall of Morganton and Dr. Thomas H. Wright of Charlotte are also members of this committee.

* * * *

In the roster of fellows by counties, the data on Dr. Roy William Kirchberg, secretary of the Jackson-Swain Counties Society, should be changed to read as follows:

Kirchberg, Roy William, Sylva; Tulane, 1933; licensed 1935, joined State Society 1936.

* * * *

Dr. Phil Minnis Sherrill rather than Dr. V. C. Lanier is president of the Davidson County Medical Society.

* * * *

The following corrections in specialty listings have been sent in:

Dr. Fred G. Patterson of Chapel Hill should be GP rather than I.

Dr. R. T. Hubbard of Asheville should be GP rather than GP and Ob.

Dr. Thomas T. Jones of Durham should be GP rather than D.

Dr. Phil Minnis Sherrill of Thomasville should be S rather than GP.

Dr. Samuel S. Cooley of Black Mountain should be I rather than GP.

Dr. C. B. Davis of Wilmington should be D rather than GP.

Dr. L. J. Taubenhaus of Shallotte should be GP&S rather than GP.

AMERICAN ACADEMY OF GENERAL PRACTICE

Eighteen outstanding medical teachers have been selected by the Program Committee for the first Annual Scientific Assembly of the American Academy of General Practice, to be held in Cincinnati, at the Netherlands Plaza Hotel next March 7, 8, and 9. The names of the essayists and their subjects will be announced later.

Arrangements have been made to accommodate more than 2,000 members and their wives. Non-members of the Academy may attend the Assembly as guests on payment of a registration fee of $5.00. Only Doctors of Medicine may register. There will be no registration fee for members.

A printed form for requesting hotel accommodations will be sent to all members later. Members wishing to make reservations now may do so by addressing the Chairman, Sub-Committee on Hotels, American Academy of General Practice, Dixie Terminal Building, Cincinnati 2, Ohio.

AMERICAN COLLEGE OF SURGEONS

The thirty-fourth Clinical Congress of the American College of Surgeons will be held in Los Angeles, with headquarters at the Biltmore Hotel, October 18 to 22.

At the annual Convocation on the final evening, October 22, more than 900 initiates are to be received into fellowship.

AMERICAN SOCIETY FOR RESEARCH IN PSYCHOSOMATIC PROBLEMS

The annual meeting of the American Society for Research in Psychosomatic Problems will be held at Chalfonte-Haddon Hall, Atlantic City, May 1 and 2.

MEDICAL SOCIETY OF VIRGINIA

The Medical Society of Virginia held its annual meeting in Richmond, October 18-20.

DIAMOND JUBILEE OF NURSING

President Truman, ex-president Herbert Hoover and Senator Arthur H. Vandenberg, heading a committee of 70 leaders in public life, have joined with the American Nurses' Association in sponsoring the Diamond Jubilee of Nursing, which will be marked by celebrations throughout the country. The memory of Linda Richards, "America's first professional nurse," is to be especially honored during the Jubilee, signalizing both the 75th anniversary of professional nursing in the United States and of Miss Richards' graduation from nursing school.

A Linda Richards Banquet will be held in New York City on November 16. The country's foremost nursing organization, with a membership of more than 162,000 registered professional nurses, will help "to focus public attention through the Jubilee on the extension and improvement of nursing service to all through the improvement of Schools of Nursing, economic security for all nurses, adequate licensure laws and more effective counseling and placement of both prospective students and graduate nurses."

A coast-to-coast program of activities highlighting the history and progress of nursing to the present day, and paying tribute to the 320,000 registered professional nurses of America, will be initiated during Nursing Progress Week, November 14 to 20.

THE NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS, INC.

Funds totaling $25,000, for production of an educational film on cerebral palsy, will be raised by the National Association of American Business Clubs within the next four months, F. H. Bachman, Champaign, Illinois, president of the organization, announced. The film, which will be produced by National Society for Crippled Children and Adults, will be available to all interested persons and groups.

Bachman also announced the appointment of co-chairmen of the cerebral palsy project for American Business Clubs. They are W. Hal Bird, Enka, North Carolina, and Schaefer Kendrick, Greenville, South Carolina.

AMERICAN RED CROSS

Broad steps towards peace and the humanization of warfare were taken at the Seventeenth International Red Cross conference held in Stockholm, Sweden, August 20-28, Basil O'Connor, President of the American Red Cross, said in a prepared statement upon his return to New York.

"Some of the most important developments in the 86 years of Red Cross history took place at the Stockholm conference," Mr. O'Connor said. "One new treaty—that affording protection to civilians in war time—and revisions of three others were proposed and approved. In addition, many new resolutions were passed, most of them affecting the world-wide operations of the Red Cross, but one in particular that called upon nations to outlaw the atomic bomb."